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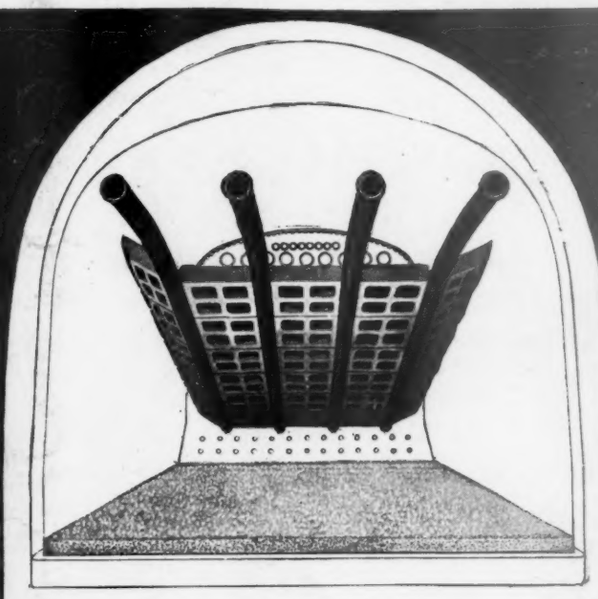
SEP 5 1923

Railway Age

SECOND HALF OF 1923—No. 9 NEW YORK—SEPTEMBER 1, 1923—CHICAGO SIXTY-EIGHTH YEAR

Published Weekly by Simmons-Boardman Pub. Co., 30 Church St., New York, N. Y. Subscription Price U. S., Canada and Mexico, $6.00; foreign countries (excepting daily editions), $8.00, and $10.00 a year including all dailies; single copies, 25c. Entered as second-class matter January 30, 1918, at the post office at New York, N. Y., under the act of March 3, 1879.



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For detailed description see CAR AND LOCOMOTIVE CYCLOPEDIAS 1922 Edition

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Railway Taxes Continue to Increase

Senator W. E. Borah of Idaho, in a speech in the United States Senate a few months ago, said: "It will be very difficult to reduce freight rates if we continue in this country to increase taxes upon the railroads as we have for the last four years." How completely Senator Borah's warning is being disregarded is shown by the continued increase in the taxes of the railways this year. In the first six months of 1923 taxes of the Class I roads amounted to $160,137,804, as compared with $148,158,570 in the corresponding months in 1922, the increase being almost $12,000,000. If railway taxes increase as much in proportion during the last half of the year as they did during the first half they will amount for the entire year to $330,000,000. Ten years ago, in 1913, they were $118,400,000. The increase in the period of 10 years apparently will be about 178 per cent. The taxes paid by the railways in the first six months of the present year exceeded the amount paid by them in any entire year prior to 1917. It seems now to have become standard practice for the taxes of the railways to exceed the dividends paid to their stockholders. In 1913 their dividends were $322,300,000, while their taxes were $118,400,000. In 1920 their taxes for the first time slightly exceeded their dividends. In 1922 their taxes amounted to $304,885,000, while the total dividends paid by them amounted to only $271,577,000. In 1913 it took one-eighth of the net earnings of the railroads to pay their taxes. In the first six months of 1923 it took one-fourth of their net earnings to pay their taxes. Those who clamor loudest for reductions of rates are also among the most active in causing the increases in taxes which contribute largely to making reductions of rates impossible.

Importance of the Railroad Ticket Agent

The approach of the annual convention of the American Association of Railroad Ticket Agents, which will be held in Portland, Oregon, in September, may well be used as a reminder to all who wish the railways well of the importance of the ticket agent in railroad service. How many railway officers and ticket agents ever stop to reflect on the significance of the fact that passenger ticket agents each day, each week and each year have direct business dealings with many times more of the patrons of the railways than any other class of railway men, except, possibly conductors? The number of trips taken annually by passengers on the railways of this country is about one billion. This means that on the average every inhabitant of the country deals across the counter with railway ticket agents nine or ten times each year. Of course, an average is an average. Some persons make very few trips and deal with ticket agents infrequently, while others make many trips and deal with them frequently. However, confining ourselves to averages, the ticket agents have in each year approximately ten chances to so deal with each person in the country as to cause an unfriendly or a friendly feeling toward the railroads. The ticket agent in his own interest and that of his railroad should be a high grade salesman. If a high grade salesman he will not merely sell tickets, but do so in a way that will make each passenger feel it is considered a pleasure and privilege to have the opportunity of serving him. There are many ticket agents who are not real salesmen and never sell a ticket without making the patron regret that he had to buy it. On the other hand, there are many who are real salesmen, and the latter class constitutes one of the most important assets of the railroads that are fortunate enough to have them in their service. There would be more good ticket agents if there were more high railway officers who appreciated fully the importance of having high grade salesmen behind their ticket counters.

Appreciation for Training Camps

There are a considerable number of railway employees among the 25,000 young men who are now returning from the various citizens' military training camps. For 30 days they have been trained in physical, civic and military exercises under the direction of officers of the regular army. This has put them in splendid physical condition, making them more fit for their work; has made better citizens of them and has helped to fit them to come to the defense of their country in time of need. Many corporations, recognizing the great value of such training, have continued their picked men on full pay during the month they were in camp. The suggestion has been made that communities would benefit greatly by welcoming these men back in such a way as to encourage them to tell of their experiences and stir up the patriotic impulses of the community. A patriotic dinner or luncheon, or a mass meeting would answer this purpose. A recognition on the part of the railways of these employees who gave the month to serious training would not only be in the interest of good citizenship and patriotism, but would help promote the movement of voluntary training with its obvious advantages to the local community and to the nation.

A Real Educational Program

The Institute of Transport of Great Britain has announced the details of the courses of study which after October 1, 1925, will be required of applicants for the lower grades of membership in the Institute. The Institute does not itself intend to set up a teaching organization. Instead it has prepared a detailed syllabus of the various subjects to be covered and in which applicants for membership are to be examined and leaves the matter of instruction to the initiative of the individual student or to the railway or other transport company which employs him. Such instruction is provided by some of the railways in conjunction with colleges and universities at various important railway centers. There are four grades of membership in the Institute of Transport, viz., student, graduate, associate member and member. Persons will be admitted to the grade of student in the future, as in the past, without examination, provided they can meet the other requirements of the Institute. Examinations will be required, however, for admission to the higher grades of graduate and associate member. No examinations will be required for election to full membership—that grade being reserved, as is usual in professional societies, for those of

long and distinguished service in the field. The syllabus of the courses in which examinations will be required is given on another page of this issue. Its thoroughness is to be highly commended. Indeed, those who successfully pass these examinations will have, in addition to their thorough knowledge of the fundamentals of the business of transportation, a grounding in general subjects, such as economics, mathematics and modern language, equal to that of many university graduates on this continent. If a wide interest in passing the Institute's examinations can be aroused among transport officers and employees, the entire transport industry in Great Britain will benefit by it, and the success of the plan would probably lead to emulation elsewhere.

Eliminate Train-Order Signals at Interlockers

The possibility of an engineman mistaking a proceed indication of a train-order signal located at an interlocking tower for the indication of the home signal of the interlocking is recognized by many operating officers and signal engineers as one factor which can contribute to serious accidents. However, as the train-order signal was, in most cases, established as standard practice previous to the extensive installation of interlockings, the majority of the roads have compromised the situation by using every available means of diverse location of the signals to eliminate confusion to enginemen. A few roads have so interlocked the signals that the train-order signal cannot show proceed unless the home signal is also at proceed. However, on perhaps a majority of the roads there still exists the potential danger of a mistake between the indications. Although accidents credited to confusion between such indications may never have happened on the lines of an individual carrier, due consideration should be given to the fact that such roads as the New York Central, the Pennsylvania, the Baltimore & Ohio, the Chicago, Milwaukee & St. Paul and the Chicago & North Western have eliminated this separate train-order signal at the tower at a great many interlockers and use one of the interlocking signals to stop the train, with auxiliary hand lanterns, flags or small discs to inform the train crew that train orders are to be received. In view of the fact that the elimination of this separate train-order signal will reduce the cost of construction and maintenance, in addition to introducing a decided factor of safety it would seem advisable for those roads still using such a combination to consider seriously the elimination of this separate train-order signal, beginning on double track high speed main lines where train orders are seldom issued at such intermediate points.

Adopt the Standard Car Designs

Within a short time, the railroads will be required to decide what position each will take on the questions submitted to them for letter ballot by the Mechanical Division of the American Railway Association, as the result of the work of its 1923 meeting. By far the most important matter to be presented this year is the question of adopting the standard car designs recommended by the Car Construction Committee. In the discussion of the report of this committee at the meeting, and since the meeting, there evidently has been some misapprehension as to the effect the adoption of the committee's designs as the standards of the association will have on the many alternate details, or groups of details, now in common use. Most of this misapprehension is groundless. In no case where alternate details can be used that conform to the dimensions shown on the committee's drawings, some of which are already standards of the association, is the use of these alternates in any way interfered with by adoption of the committee's designs and specifications. The adoption as standard of the trucks shown on the committee's drawings in no way limits the future use of trucks with journal boxes of the type already standard, in any truck frame of proper capacity conforming to the standard dimensions already established by the association. This also applies to roofs and other special details. No railroad officer who believes in the desirability of standard box car designs, can do better than to vote for the designs now up for adoption. Should these designs be rejected and the whole matter referred back to a committee of different personnel, it is extremely doubtful whether the work of a new committee, although differing from that of the present committee, would come any nearer to meeting the detail objections of a majority of the members of the association than has the work of the present committee. The *Railway Age* believes that standard box car designs, with liberal latitude as to alternates, are desirable; that they will be of tremendous assistance to many railroads in securing good equipment with a minimum of engineering expense, on a satisfactory basis, and that their adoption now will have a wholesome effect on public opinion. If adopted, it is to be hoped that the railroads will support the association by building cars to the new designs. Indeed, some railroads have already signified their intention of building cars of any designs which the association may adopt as its standards. Let the railroads as a whole support the action of the association in the same manner and they will present an effective answer to those who propose an elaborate form of central ownership and control of equipment because of the alleged inability of the railroads of the country effectively to co-operate.

The Need of Uniform Crossing-Stop Laws

TODAY, SEPTEMBER 1, is the date set for the going into effect, in California, of a law passed by the last legislature of that state, requiring automobile omnibuses carrying passengers for pay, including those carrying school pupils, to be stopped before passing over railroad grade crossings. The statutory requirement includes also truck loads of explosives and inflammables (gasoline). California is the fifth state that has taken action in this matter; and Alabama, where a bill was introduced in the legislature on August 7, by Senator Garth, will probably make a sixth; and the most obvious need at present, from a national point of view, is a conference of state representatives to see if something cannot be done to secure some degree of uniformity in this much needed legislation. Much diversity already exists. The utility of interstate conferences is very well recognized where diverse laws have caused inconvenience, or worse, for a period of years and everybody has become acquainted with the evils needing to be cured; but our present-day life travels at too fast a pace for any such slow process as that; the automobile danger is country-wide and there are public officers in every state, who, if they have the necessary courage and energy to act, can do great good by proceeding to simplify these laws, and introduce all practicable uniformity before, instead of after, a long period of experiment and halfway measures. Can there be any state that will *not* desire to set advanced standards of safety in this matter? Already a number of serious errors have developed, and changes in laws will be proposed, no doubt, in considerable variety. Legislators who introduce bills on subjects of this kind are usually more noted for originality and public spirit than for matured wisdom in law enforcement; and a conference is needed for the purpose of bringing to the surface the best experience and

information, from all quarters, for the benefit of the whole public.

The experiences of Virginia and North Carolina afford a variety of instructive incidents supporting this argument. The information is rather fragmentary and is both hopeful and the opposite; but there are some definite points. In Virginia, where the law went into effect July 1, 1922, the results were sufficiently good to have a decided effect in leading to action in North Carolina. One railroad in Virginia reports a reduction of 50 per cent in fatal injuries at crossings in the first four months under the new law—from 12 to 6; while the number of automobiles in use had increased 27 per cent. The general statement is made that the law is "fairly well observed;" but in Virginia local magistrates have been accused of petty persecution, or worse; and in North Carolina a watchman at one crossing (on a railway of very light traffic) reported only 23 per cent of automobiles stopping. This question of adjusting the terms of statutes to crossings where automobiles are very numerous and railway trains very infrequent, is one that must be tackled with vigor, if respect for law is to be maintained. In Virginia the law excepts "branch railroads and those of purely local service;" but in deciding where to draw the line in using this definition, varied questions are encountered. In North Carolina the law (in effect only two months) leaves cities and towns free to maintain any and all desired local regulations, so that a multitude of perplexing problems have already arisen.

In a matter so intimately affecting people in every town throughout the whole country it is especially important to give lucid publicity to all useful lessons derived from local experiences; for local sentiment is sure to have decided influence. This is well; and yet uniformity of practice throughout the country is of unquestioned importance. There is need of a conference, as we have suggested; while at the same time the most important need *in* that conference will be a full and exact presentation of experiences and well-grounded opinions from all quarters of the country. The need of this democratic element has been illustrated already by a press notice issued from Washington in July, under the authority of a member of the cabinet, calling attention to crossing dangers. Mention is made of a track near Raleigh, N. C., which is not used more than one month in the year but where the crossing stop is required by the new law. No immediate remedy is offered, except that the trains instead of the automobiles ought to be stopped; but the principal conclusion of the monograph is that separation of grades is the remedy; thus turning the thoughts of uninformed newspaper readers, not to the immediate duty of securing safety for themselves and their neighbors, but to a vast problem which, because of its unexampled costliness, will take from 60 to 600 years to carry out. Grades must be separated, wherever practicable; but it is the next generation, not this one, to which will accrue the principal benefit from such expenditures.

The suggestion for a national conference might well be addressed to state railroad commissioners as being, undoubtedly, the public officers who should be best qualified to take broad views on the subject; but many other citizens, if public spirited, may find that they have a duty in the premises. There are many details to consider. The statutes thus far enacted suggest the following: What crossings shall be included? On main lines, on light main lines, industrial tracks, interurban lines; differences as between city and country; attended and unattended crossings; crossings attended part time. Signs: Height, distance from track, color, wording, lettering; exceptions, city and country. What kinds of vehicles? Automobiles only, or horse-drawn also? Penalties: Fines or imprisonment. Policing, detecting offenders. Jurisdiction: Local courts or higher courts? Concessions to local administrative authorities.

Coal Mining and Railroad Labor Conditions—a Contrast

THE QUESTION of repealing the labor provisions of the Transportation Act undoubtedly will be raised in Congress next winter. It is understood that organized labor will seek their repeal, which would involve abolition of the Railroad Labor Board.

The threatened strike of anthracite miners may appear to have no relation to this question, but actually it throws light on it. The anthracite miners, although receiving the highest wages they ever were paid, are demanding an increase. They claim the profits being made by the operators are sufficient to enable them to advance wages without advancing the price of coal. The operators say they cannot advance wages without advancing prices. They have offered to arbitrate, but the Mine Workers' Union has declined their proposal.

The situation presented is similar to that which several times developed on the railroads before the war. The United Mine Workers think they are strong enough to put the controversy to the test of a strike. The public is ignorant of the rights and wrongs involved. There is no impartial and authoritative body to tell the public the facts and on the basis of the facts make an award upon which the public may reasonably rely as fair. About all the public knows is that it is threatened with a cessation of anthracite mining from which the public would be the chief sufferer.

The railway labor unions, also believing that they were strong enough to win a strike, absolutely refused, on certain occasions before the war, to arbitrate. The creation of the Railroad Labor Board in 1920 was the result. There has been much criticism of the way the board has performed its functions. It has been charged with interfering too much with the relations between the railways and their employees. The first real nation-wide strike of railroad employees that ever occurred—that of the shop crafts' unions—occurred last year in disregard and defiance of the fact that an award had been made by the Railroad Labor Board. The occurrence of this strike has been used as evidence that the Labor Board is a failure.

In view of the situation that now exists in the anthracite mining field, and of the history of labor controversies in the coal mines and on the railways during the last four years, it is hard to avoid the conclusion that the Railroad Labor Board has served and is serving a very useful purpose, and should be preserved until a clearly better agency for settling railway labor controversies has been suggested.

The first important act of the Railroad Labor Board was to award, effective on May 1, 1920, the largest advance in wages ever given to any class of working men at one time. It subsequently, during the period of depression, awarded reductions of wages. More recently it has awarded advances to some classes of employees. In most cases these awards have been preceded by bitter discussions and struggles, but it is probable just as bitter discussions and struggles would have taken place if the Labor Board had not existed to pass upon the matters in controversy. There have been wide differences of opinion as to whether the wages awarded have been just and reasonable. But just as wide differences of opinion were expressed regarding wages awarded by arbitration boards under the Newlands Act before the war, and by the Board of Wages and Working Conditions of the Railroad Administration during the war. It is true the award in the shop crafts' case was followed by a nation-wide strike. But is there really any good reason for believing that if the Labor Board had not existed the differences between the railroads and their shop employees could have been settled without a strike?

There has been comparative peace in the railroad labor

world during the last three years, considering the widely changing and trying conditions during these years. Serious controversies are bound to occur between employers and employees in any large industry in which the employees are practically all organized into labor unions. We formerly believed that the existence of the Labor Board tended to make it more difficult to settle such controversies by agreement, because in case of failure to agree appeal could always be taken to the board. We believe now, however, experience has shown that the existence of the Labor Board increases rather than reduces the probability of agreements being reached by the railways and their employees. The principal obstacle to agreements being reached always is that one side, or both, in an effort to "put something over," takes a stand that is wholly unreasonable. Experience seems to indicate there is less tendency for either side to take a wholly unreasonable stand when appeal can be made to a permanent arbitration board created and required by law to apply the rule of reason. Hearings and awards by a permanent body such as the Labor Board have two very great advantages. First, the parties are required in the hearings to present publicly and fully all the evidence and arguments at their disposal. The public is not left in practical ignorance of the issues involved and the facts bearing on them. Secondly, the award made tends to crystallize public opinion. This means that public opinion usually will demand acceptance of the award, and in case of a lockout or strike probably will cause defeat of the party that rejects it. In actual experience, practically all awards made by the Railroad Labor Board have been accepted by both parties. In the one case where an award was followed by an important strike the strikers lost.

The labor provisions of the Transportation Act are not ideal, but labor developments on the railroads certainly have been more satisfactory than in the coal mines. Most of the bituminous mines were shut down by a strike in November and December, 1919. Most of the bituminous and all the anthracite mines were closed for months by a strike in 1922. Now the anthracite mines are threatened with another strike. In this period, during three and a half years of which the Transportation Act has been in effect, there has been only one serious railroad strike, and it did not interfere anywhere near as seriously with the business of the country as the coal mine strikes.

There is more reason for arguing that the plan of settling labor controversies now being tried in the railroad field should be extended to the coal mining industry than for contending that it should be abolished in the railroad field.

A Good Time to Study Delays

SPRING FRESHETS and floods afford the best index of the adequacy of waterway openings under the tracks and very forcibly indicate any inadequacies. Observations made at such times constitute a valuable basis for later improvement of these structures and they are commonly made a part of the permanent record for this purpose. In the same manner high tides of traffic show those places where congestion and delays are occasioned by inadequate facilities and afford an opportunity to detect the measures which will offer the greatest relief. Operating officers will have an opportunity to study the capacity of their lines while handling the heavy traffic of the next few weeks and to note the places where trains are delayed and the free movement of traffic hampered. A careful study of all details of the movement of this peak traffic will afford an excellent basis for the preparation of the improvement program for succeeding years. Such a study may show where switching crews are losing time because of conflicting movements over yard leads. At other points, it may indicate that trains are held out of terminals for the lack of a few set-out tracks at the entrance to the yard which would enable the crews to be released. A study of the dispatcher's sheets may show a tendency for trains to collect at certain points and indicate the possibility either of adjusting the schedules of carded trains slightly to change these meeting points or of providing additional passing tracks to eliminate congestion at these points. Limited storage facilities at certain water stations may also be leading to delays or to excessive charges for attendance and indicate the economy of enlarging these stations. A survey of the conditions which interfere with train movements, made at the time when the number of trains is at the maximum, will show those points on heavy traffic divisions where delays can be eliminated most readily and marked economies effected with relatively small expenditures. It is important that operating officers avail themselves of the opportunity to study the movement of this flood traffic, for information gained at such times affords a far more reliable index of line capacity and of its shortcomings than arbitrary judgment under more normal conditions.

New Books and Special Articles of Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

The Hobo: the Sociology of the Homeless Man, by Nels Anderson. A first-hand study of migratory casual workers, including their various relations to railroads and railroad police [p. 155 et seq.] and what can be done about it. 295 p. Published by University of Chicago Press, Chicago, Ill.

Parties and Party Leaders, by Anson Daniel Morse, with an introduction by Dwight W. Morrow. Especially Chapter 14, "The Commercial Relations of American Countries," discussing traffic flows by rail and water. 267 p. Published by Marshall Jones Co., Boston.

Railway Transportation in the United States, by Senator Albert B. Cummins. 67th Cong. Senate Committee print of articles on railway conditions, previously included in this list. 29 p. Published by Government Printing Office, Washington.

Periodical Articles

The Ambush of Italy, by Kenneth L. Roberts. Discusses railroad situation in Italy before and since the Fascisti coup. Saturday Evening Post, Aug. 25, 1923, p. 6-7, 34-38.

Coal Control and the Constitution, by Charles Kellogg Burdick. North American Review, Sept., 1923, p. 297-308.

A Coaler and Its Prospects, by John M. Kennedy. The C. & O. from an investment point of view. Magazine of Wall Street, Aug. 18, 1923, p. 707.

The Cost of Progress, by Charles Pierce Burton. A thoughtful article on causes and remedies for today's railway conditions. Harper's Magazine, Sept., 1923, p. 462-474. Reprinted in part under title: "Why Railways Are Falling Behind," in N. Y. Evening Post, Aug. 24, 1923, p. 6.

The Railroad Investors' Plight, by Philip W. Henry. Letter suggesting what would have happened to Senator Magnus Johnson if he had bought Minnesota railroad stock instead of Minnesota land. New Republic, Aug. 29, 1923, p. 22.

The Railroad Situation, by Charles Dillon. California Journal of Development, Aug., 1923, p. 5, 25, 28.

Railroads Complete Record Half Year, by Arthur J. Neumark. Survey of railroad performance from January to June, 1923. Magazine of Wall Street, Aug. 18, 1923, p. 708.

Letters to the Editor

More Training for Transportation Officers

CLEVELAND, Ohio.

TO THE EDITOR:

All people are dependent on transportation. This being conceded, is it not logical to select specialists for transportation positions? Railroad maintenance and operation, with their complications, require many specialists who are trained for their particular lines of work, including civil engineers, motive power experts, accountants and others.

No activity connected with railroad operation requires the diversified knowledge that transportation does. It is the greatest field of all. Good and economical service must be rendered; without it railroads fail to meet the demands of the public and the stockholders. Why then should not transportation officers be selected and trained in a more comprehensive way than that now prevailing? The complexity of the problems connected with transportation can only be appreciated by one who has had the proper training.

Transportation officers are selected from all branches of services and they have been successful, which proves that good men can be secured from different channels. Some positions afford better opportunity for development and advancement than others. A train dispatcher has the best opportunity of all, the reasons being obvious when one considers that he comes in close touch with the superintendent and other officers and with all of the problems that enter into operation; his mind is trained almost entirely in transportation. His position more than any other demands continual concentration. He learns to act quickly. Yet with all this advantage it is surprising how few men take advantage of this school while so many appear to be satisfied to remain train dispatchers.

Some railroads select their transportation officers almost exclusively from one class of employees. It is the writer's belief that the field should be open for competition. With the knowledge that advancement can be secured through study and effort on their part, many more will strive for it.

How are men selected for operating positions today and what schooling do they receive before they are placed in official positions? Some have one system, others another. A superintendent's position today is different from that some years ago because of the increasing public demands, growing federal and state regulation and the increasing strength of labor unions. Officers in days gone by consisted almost entirely of practical men who rose from the practical school. They were successful in their day. While the fundamentals are still the same the qualifications were not those that are required today.

Selection should only be made after careful investigation by the superintendent. After this is done the education should start—two or three months in the train dispatcher's office, a month in the superintendent's office, two or three months in station work and then at least two months traveling on the road in train service and yard operation, reporting direct to the superintendent with frequent conferences with the superintendent to discuss his observations and conclusions. His observations should be watched as a good observer is an asset. Remuneration while this training is going on should be attractive. During this time the superintendent would, no doubt, derive enough benefit from the man's work to justify the expense, without taking into consideration the finished transportation product.

Many articles are being written on the lack of college men on railroads. A college man should be able to answer this if he would. It is the writer's opinion that after spending years in getting an education college men do not care to accept a subordinate position that will require at least five years' service before they receive official recognition, and then stand a chance of never getting it, so they elect to secure positions where they can apply their talents and education at once in a field that pays them more at the start than they will receive on a railroad at the end of five years. By that time they will also no doubt have advanced in their selected occupation to positions of authority and greatly increased compensation. To get college men more attractions must be offered than at present. Men who start their career on railroads without a college education are as a rule satisfied with the work and opportunity, and if they improve themselves in other respects while they secure the practical knowledge, develop into valuable men.

It was estimated at one time by the Pennsylvania that it costs $5,000 to educate a locomotive engineer. The cost to educate an officer under present methods has never been estimated for the reason that there are so many chances for loss to occur which are so difficult to locate that it would be impossible to determine the cost even approximately. No institution has so much individual isolated supervision as a railroad, and any mistake made by the individual is covered up unless detected by someone in authority. Men, as a rule, do not report themselves.

A few of the attributes necessary in an operating officer are even temperament, tenacity in "sticking" under discouraging conditions and criticism, the ability to handle men, powers of observation, quick action and good judgment. More trained expert specialists are required for official transportation positions. Their efforts should be concentrated on transportation problems, since a multiplication of duties will detract from transportation efficiency.

H. O. DUNKLE,
General Agent, Erie Railroad.

The Responsibility for Tie Purchases

CHICAGO.

TO THE EDITOR:

No one reading the *Railway Age* in recent months can help knowing that one of the problems of the railroads is that of cross tie supply. Other than an attempt by Congress to bring about an investigation as to the possibility of using a steel tie, the public knows little about cross ties. The fact that of the supplies used by the railroads fuel comes first and ties and lumber second is new to many. However, this lack of appreciation of the cross tie problem is not confined to the public.

The motive power department has a very important part in the selection of fuel. Furthermore, the shipment of the wrong kind of fuel to a territory, or for use on the wrong type of locomotive, is heard from within 24 hours. So a wrong move or a poor purchase is checked up immediately.

If the prompt checking of conditions were practicable in the purchase and distribution of ties, many of the abuses and customs would not be allowed to continue. Ignorance, both feigned and real, has been the cause of much that should be corrected if we are to arrive at a proper solution of the cross tie problem.

Take first the utilization, because that really is the goal toward which all programs should direct their energies. There is, no doubt, a proper size of tie for most tracks and within reasonable limits the size of the tie need not change as often as the rail changes. In other words, a heavier rail

section is the first move on any territory which suddenly develops heavier tonnage, so that any program which any railroad may develop as to the proper size of tie for any given territory can be considered as a fairly stable standard for that particular territory.

The why's and wherefore's of a certain size of tie for a certain territory will naturally vary to some extent among the officers of any one road, but it is my experience that most of them are prone to think that they need a larger tie than experience should have shown is required. This reaction is psychological because from past experience they have found that no matter what they have ordered, they have received what they were given, so that, railroad style, to be on the safe side they have naturally ordered something better than needed, hoping to get a certain percentage of what they ought to have, with some better and a lot that should never have been sent. Furthermore, they are usually given to understand that while they may reject cement because it will not meet the test, or reject a thousand and one other materials which they use, ties are surrounded by a peculiar atmosphere and any attempt to criticize or judge is considered taboo. This cannot help but create a feeling of helplessness on the part of the roadmaster and section foreman, so that through long years of such environment, most roadmasters and engineers have allowed themselves to get into a state of coma insofar as ties and their proper utilization are concerned.

Another thing that adds to the difficulty as to utilization is that so few railroads properly classify their ties before shipment, but ship promiscuous sizes to a division and then let the division work out its own distribution system. There is nothing that increases the cost of tie renewals more than the rehandling and reshipping of ties not properly classified. The average cost of handling a tie onto a car, including work train costs, runs between 10 to 15 cents. The cost of unloading is about half that figure. In other words, ties improperly distributed require extra handling enough to almost pay for their creosoting.

Another serious situation developing in the proper utilization programs on any railroads is the wasteful ignorance of so many of those who should know something about the quality, strength, values, etc., of various species of timber. Few modern roadmasters have any timber knowledge. Differences in the quality of steels, and the necessity of various aggregates of concrete are driven home to every young engineer and no one calling himself an engineer would think of using the same specifications for steel regardless of its use. On the other hand, the ignorance of strength values of ties is appalling.

Another problem of adaptability and utilization on which much oratory has been wasted in the past is that of the relative merits of hewn and sawn ties. Some roadmasters will say that there never was a sawed tie that could compare with a hewn tie, as the saw, in going through the tie, opens up the pores of the wood and allows the moisture to enter more readily. Microscopic examination of the ties does not confirm this theory with the added objection to the hewn tie of many hacks of the axe, which come as a natural result of hewing which in the aggregate really increase the exposed surface of a tie. If there ever was any argument that hewn ties came from better timber than sawed, this is fast losing its force, since timber that formerly would have been hewed is now being sawed into ties, because the lack of tie hewers has compelled the adoption of the small portable tie mill for sawing ties. Furthermore, the side cuts from these same mills sell as timber and thereby conserve our timber supply and this practice should be fostered rather than criticized. In actual practice the inspector will also automatically get a better sized tie when it is sawed than when it is hewn. He is prone to average up the face of the hewn tie, particularly if it is a butt cut, whereas in the case of the sawed tie, it is cut straight and dimensions are usually such that the inspector sees at a glance that it is either 6 or 7 inches thick and that it equally clearly indicates its breadth, and he is not nearly as apt to hammer it a Grade 5 when it really only measures a Grade 4.

The utilization plan must have as its corollary, a distribution program and herein lies the ease with which any utilization program can be made effective. Ties can be sorted at the treating plant into as many utilization schemes as is found necessary or expedient.

Few operating officers know the relative differences in tie sizes and herein lies the opportunity of most tie producers and all too often they do not take the pains to enlighten the prospective consumer. Oftentimes the wholesale producers know more nearly what the consumer ought to have than he does himself. This seems like a paradox but it is true and this again illustrates what some purchasing agents have to contend with because oftentimes operating officers ask for something that the purchasing agents know is not what is wanted.

If there is ignorance due to lack of knowledge, it is certainly displayed in tie problems because ignorance is the only excuse for some of the practices now prevalent. As far as specifications are concerned, those approved by the American Railway Engineering Association offer all the latitude required by any railroad. But any specification is worth just as much as its interpretations. Why any purchasing agent would consent to allow his inspectors to hammer a tie as grade 5 when it actually measures the requirements of grade 1 is beyond comprehension. If that same purchasing agent were buying rails, cement or some other commodity, and the inspector committed such gross violations, he would immediately be discharged for dishonesty. Not so when it comes to railroad ties. The purchasing agent squares the action of his inspector by saying that the railroads must have ties right now, and that this is not the opportune time to hold to grade because if he did, other railroads would get the ties. This excuse is so worn, that it is threadbare, but it continues to be the stock phrase. In case the purchasing agent says that the inspector was acting on his own judgment, and that he was wrong in so doing, the purchasing agent knows that he is protecting his inspector on one hand and getting the ties on the other hand.

And what becomes of these ties? Where do they go? They eventually are laid somewhere. Who pays the bill? The whole maintenance bill covers them. The roadmaster takes what he can get and feels fortunate in getting anything. And this lax attitude of the engineering and maintenance department has but one answer. The purchasing agent knows what he is getting and that the maintenance people are making ends meet.

How long this scheme of letting the purchasing agent run the tie business on the railroads will continue depends largely on whether the purchasing agent shows more skill and knowledge of the actual requirements of the railroads tie than does the engineering department. At present it can be pretty generally stated that the purchasing agents do what they please and the engineering departments use what they get.

There are a few shining examples of the reverse practice and it is remarkable to note that the best example of the engineering department knowing what it requires and seeing that the purchasing agent delivers what it wants results in that railroad having the lowest tie renewal percentage of any railroad in this country. And yet it is the cheapest operated tie renewal in the country. How do you account for it? The engineering department handles the maintenance and because of this fact it knows what size and grade tie goes into each particular section of the road and then sees to it that the purchasing agent buys what is required to carry out that program.

TIE USER.

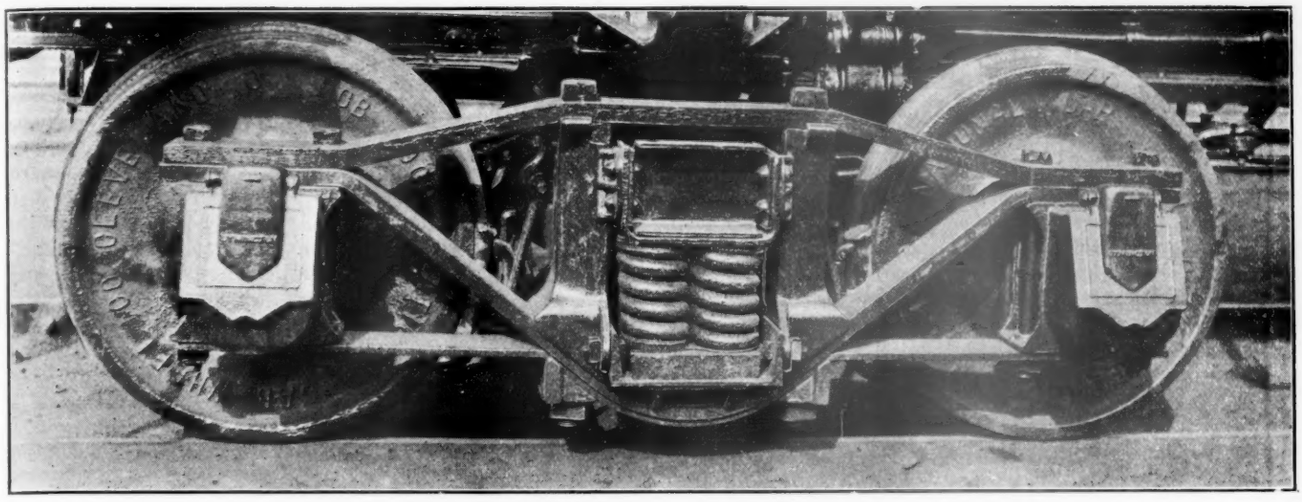


Fig. 1—Fifty-ton Truck with Improved Arch Bar Side Frame

Tests on Different Shaped Arch Bar Side Frames

Slight Changes in Design Reduce Unit Stresses from Over 40,000 Lb. to About 20,000 Lb.

By Louis E. Endsley
Professor of Railway Mechanical Engineering, University of Pittsburgh

THE PURPOSE of the tests described was to determine the stress set up in different shaped arch bar truck side frames under direct vertical load, transverse load and twisting load. The loads used were—for the 50-ton trucks, 68,500-lb. vertical load, transverse load of 9,000 lb. and a twisting load of 6,000 lb., applied at the center of the truck spring seat. For the 70-ton truck tested the load was for the direct vertical load, 95,000 lb., transverse load 12,600 lb., twisting load of 8,400 lb., applied at the center of the truck spring plank.

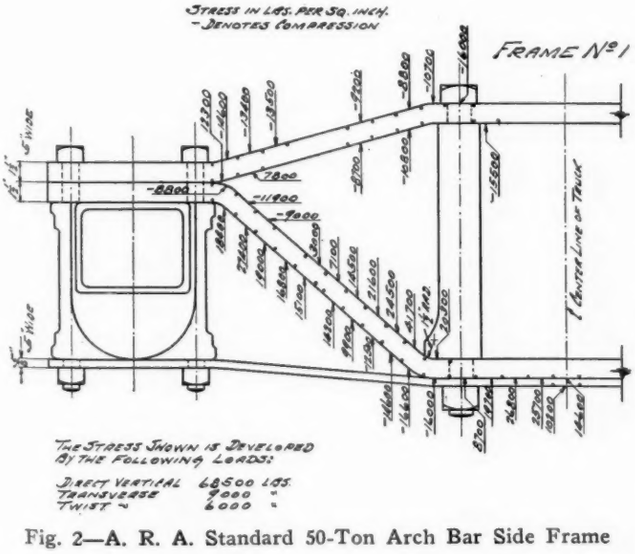

STRESS IN LBS. PER SQ. INCH.
-DENOTES COMPRESSION
FRAME Nº 1
THE STRESS SHOWN IS DEVELOPED BY THE FOLLOWING LOADS:
DIRECT VERTICAL 68500 LBS.
TRANSVERSE 9000 "
TWIST " 6000 "

Fig. 2—A. R. A. Standard 50-Ton Arch Bar Side Frame

The tests were conducted at the plant of the Pressed Steel Car Company, located at McKees Rocks, Pa. The machine used was their 600,000-lb. Olsen testing machine. A direct vertical load was transmitted to the spring seat of the side frame by a cast steel foot to a strip of iron lying over the center line of the spring seat. The load then acted through a filler block to a circular ball bearing which rested on the spring seat. A wooden block was used above and below the ball bearing to take up any irregularities on the surface of the casting or in loading.

The ends of the frame were supported on blocks which took the place of the wedges in the journal boxes and blocks just below that took the place of the brasses. These lower blocks were knife edged by circular grooves in short axles which were supported by filler blocks. Great care was taken to insure the line of force passing through the center of the arch bar and half way between the two journal box bolts.

A transverse load was obtained by manually applying the load to a calibrated spring at each end of a beam which was anchored to the frame by means of bolts and transmitted by a beam to the column casting through a knife edge at the center of the column. To apply a twisting load, a calibrated spring received a load and transmitted it to a ball-crank and thus to the spring plank.

The instruments used for determining the stress throughout the frame under the different loads were the Berry strain gages. These gages are so constructed that the elongation per inch can be accurately determined to .0001 of an inch.

Description of the Side Frames

This report covers the tests of five different arch bar side frames, four of them were for 50-ton and one was for a 70-ton car. No. 1 was a 50-ton standard ARA frame which had top and bottom arch bars 5 in. by 1½ in. and a ⅝-in. tie bar. An outline of the frame is shown in Fig. 2.

No. 2 frame was a Pennsylvania standard 50-ton arch bar side frame with a top and bottom arch bar of 5 in. by

1¼ in. and a ⅝-in. tie plate. This frame is much like the ARA frame but the bars are only 1¼ in. thick instead of 1½ in. as in the ARA 50-ton frame and the radius at the bottom bend of the lower bar is 2⅞ in. instead of 1½ in. as in the standard ARA arch beam frame.

No. 3 frame was a new 50-ton design which had a lower bar that had a 19¾-in. radius in the bottom part of the frame, this radius being tangent to the diagonal tension part of the bar at the outer point of contact with the column. On top of this bar and under the spring plank was a small malleable iron filler block on which the spring plank rested. As the column bolts passed through the bottom bar at an angle a small V-shaped malleable iron washer was placed between the tie bar and the column bolt nut. The top and bottom arch bars on this side frame were 5 in. by 1¼ in., tie bar was ⅝ in. thick.

No. 4 side frame was a 50-ton arch bar frame very similar to No. 3 but as shown in Fig. 3, the radius is only 11 in. at the bottom and the straight portion of the lower arch bar extends to the bottom or inner edge of the column and the bottom of the column is a diagonal straight line instead of a curve as in frame No. 3. The malleable iron filler block is somewhat thicker in this frame.

Frame No. 5 was a 70-ton arch bar side frame. It also had 11-in. radius at the bottom and a malleable iron filler block. However, in this frame the V-shaped washers are located between the bottom bar and the tie bar and the column bolt nut comes up against the bottom tie bar. The size of bars in this frame is 6½ in. in width and the thickness of the top bar is 1½ in. while the bottom bar is 1¼ in.

Each bar was laid out at the points of reading on each edge ⅛ in. in from the upper and lower sides of the bar. Some readings were also taken at the tie bar. Small holes were drilled at each point which were used for placing the points of the Berry strain gage.

The frames were mounted and centered on the testing machine and a load of something greater than that for which the test was made was applied to the frame to be sure that all parts were seated after which the load was reduced to 5,000 lb. Several Berry strain gages were clamped at different points on the side frame. The direct vertical load was then increased to 73,500 lb. on the 50-ton frames and on the 70-ton frames 100,000 lb., making an effective load of 68,500 lb. on the 50-ton frames and 95,000 lb. on the 70-ton frames.

The transverse load of 9,000 lb. and 12,600 lb. on the 50 and 70-ton frame were respectively applied and the Berry strain gage again read after which a twisting load of 6,000 lb. for a 50-ton frame and 8,400 lb. for a 70-ton frame was applied and the fourth reading was taken on the gage. The instruments were then placed at a new position and set to zero with all loads acting. The three loads were then successively removed in a reverse order to which they had been applied, that is the twisting load first, the transverse load second, and finally the direct vertical load. By continuing this method of taking the four readings at each point, the stress equivalent to each of the loads was determined until all points where readings were desired with a 2-in. Berry strain gage on the 50-ton frames, were covered. However, in the test of the 70-ton frame a somewhat more sensitive and accurate gage of the Olsen type was used at the most important points where readings were taken. All frames were tested in identically the same manner as described above.

Figures 2 and 3 give the results of maximum stress obtained at any point on two of the frames, the arrow indicating the middle of the point where the gage was seated, the figure representing either tension or compression at this point. The stress here arrived at was the average of the four identical points on the frame, that is there were readings taken on both ends of the frame and on both sides of each bar. The stress here given has the sign either tension or compression of the direct vertical load. To this was added the average of the other four readings taken, which were produced by either the twist or transverse load. While the transverse and twist load acted only in the one direction in these tests, it might in actual service act in either direction. This might add to the direct vertical stress if it was either in tension or compression so that the stresses here shown are the average maximum stress in pounds per square inch that would come at any point on the side frame in service under these loads. Where there is no indication before the number, it is tension, but where there is a minus sign before the number, it indicates compression.

From a survey of these figures, it will be seen that the

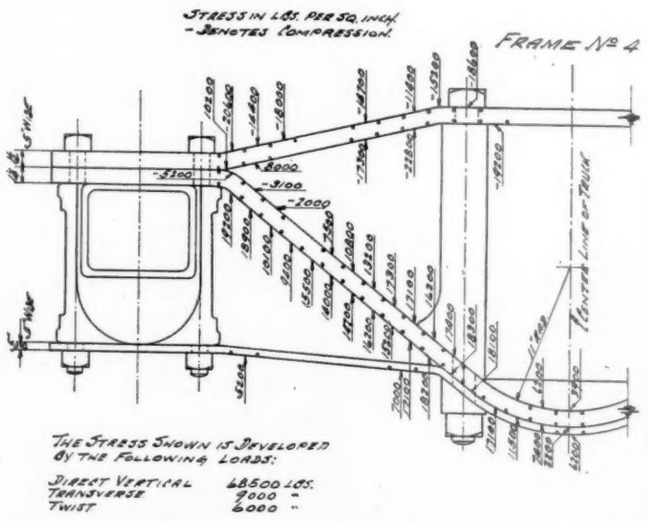

STRESS IN LBS. PER SQ. INCH
-DENOTES COMPRESSION.
FRAME Nº 4
THE STRESS SHOWN IS DEVELOPED BY THE FOLLOWING LOADS:
DIRECT VERTICAL 68500 LBS.
TRANSVERSE 9000 "
TWIST 6000 "

Fig. 3—Improved Arch Bar Side Frame for 50-Ton Trucks

ARA standard 50-ton truck has one point at the radius at the bottom which indicated a maximum tension stress of 41,700 lb., and another point at the bottom of the bar between the column posts of 26,800 lb. These stresses, in great measure, show why arch bar trucks in the past have broken near these points. However, No. 4 which is also a 50-ton arch bar frame, has a maximum stress of 22,800 lb. This is at the bottom of the compression member near the column bolts and it has a maximum stress in tension of 19,200 lb. which is at the top of the lower bar at the bottom. All other points on the tension member are less than 19,000 lb.

Frame No. 5 which is a 70-ton 11-in. radius bottom bar has a maximum stress in tension of 20,400 lb. and this is at the same upper bend of the lower arch bar. No other point on the frame shows over 20,000-lb. stress. From the results here obtained it is evident that Nos. 4 and 5 frames have a very much lower stress than either one of the first three.

While only the results of five frames were given in this report there were in all twelve different designs of frames tested and sometimes two or three of the same design, but the other frames in most cases fell between the maximum and minimum results here given. The last two frames given are well within the strength of the metal to last the life of the car. Approximately 4,000 cars were built in 1915 and 1916 of a design very similar to that of frame No. 4, Fig. 1 and Fig. 3, of the 50-ton capacity and these frames on these cars are still in service after approximately eight years and from a careful check of all these cars by the officials of the roads having them in use, no arch bar failures or cracked bars have ever been discovered. There is now being built some cars of the frame No. 5 and as the stress in the 70-ton frame is no greater than that in the 50-ton frame, which has been in service for eight years, the same service without failure doubtless will be obtained in these 70-ton cars.

Battery Repair Methods on the C. B. & Q.

Overhauling Concentrated at Aurora Where "Overway" Track System Expedites Handling of Batteries

During the past three years the Chicago, Burlington & Quincy has completely changed its system of overhauling car lighting batteries; this has resulted in more efficient service and a marked economy of operation. As it was necessary to maintain a battery room at the car shops at Aurora, Ill., for overhauling batteries on cars undergoing general repairs, it was decided to centralize all battery work at that place. This not only permitted a reduction in the total number of men employed on such work but left the men at the passenger terminals free to give more attention to running repairs, thus bringing about greater operating efficiency for the car lighting service.

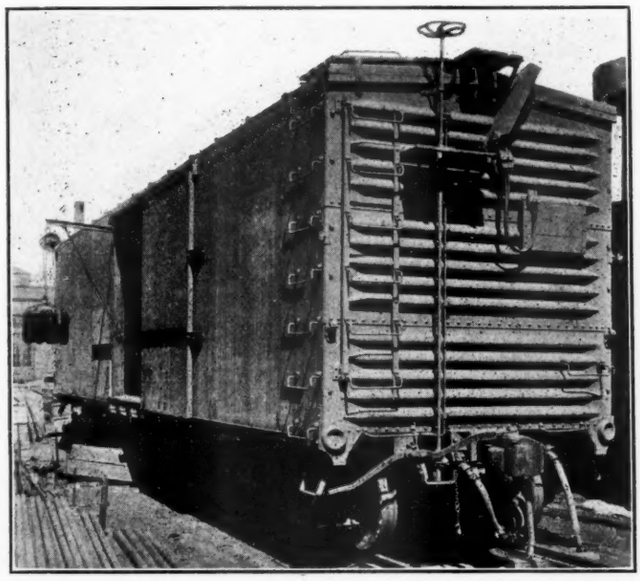


Fig. 1—Freight Car with Special Train Line Connections and Crane Equipment

Special Car Used for Shipping Batteries

A special car was equipped for shipping exhausted batteries from the several terminals to Aurora, and sending back the repaired batteries. A modern freight car was fitted with a special bracket crane on the door frame; this with a ½-ton chain hoist and battery tongs facilitates the loading and unloading of cells. A special truck, so constructed that the cells can be easily picked up, is used inside the car to bring the cells to the door. About 162 two-cell crates can be placed in the car when the batteries are placed close together on the floor at the two ends of the car. The car can be loaded or unloaded in about two hours. When a loaded car arrives at the Aurora shop the "Overway" track system is extended into the car; it is supported by a steel horse, as shown to the right in Fig. 2.

Until recently the Burlington has used the 64-volt, 3-wire head-end car lighting system, with the turbo-generator in the baggage car, on all main-line through trains. Every third car in connection with this system is provided with a 64-volt set of batteries. The road is now equipping a number of the one-night run trains with 32-volt axle light systems. Suburban trains operating between Chicago and Aurora are lighted from a small turbo-generator located on the top of the boiler of the locomotive between the sand dome and the cab; no batteries are necessary with this system of lighting. In addition to the batteries on Burlington equipment, the batteries of all Pullman cars not equipped with axle generators, and which are regularly assigned to the Burlington, are maintained at the Aurora shop.

Overway System Eliminates Manual Lifting of Batteries

An ingenious system of "Overway" track, together with chain hoists and clamps, expedites the handling of batteries and eliminates considerable labor. This track system, as shown in Fig. 3, is supported from overhead beams. The track is constructed of special steel channel sections supported by hangers from above, so arranged that a small eight-wheel car can run inside the channels. The track lay-out consists of three tracks the length of the building, together with one cross-lead that can be extended into the car, as shown in Fig. 2. Two of the runs lengthwise of the building extend over battery benches used for storage and charging, while the other lead extends over the center bay where the battery overhauling, washing and reassembling is done. The little cars, to which the chain hoists are attached, can be switched from one track to another by switches operated by pull chains. With the two-way switch one end of a four-foot section of the rail is simply swung from one connection to the other; the three-way switch, shown to the left of the

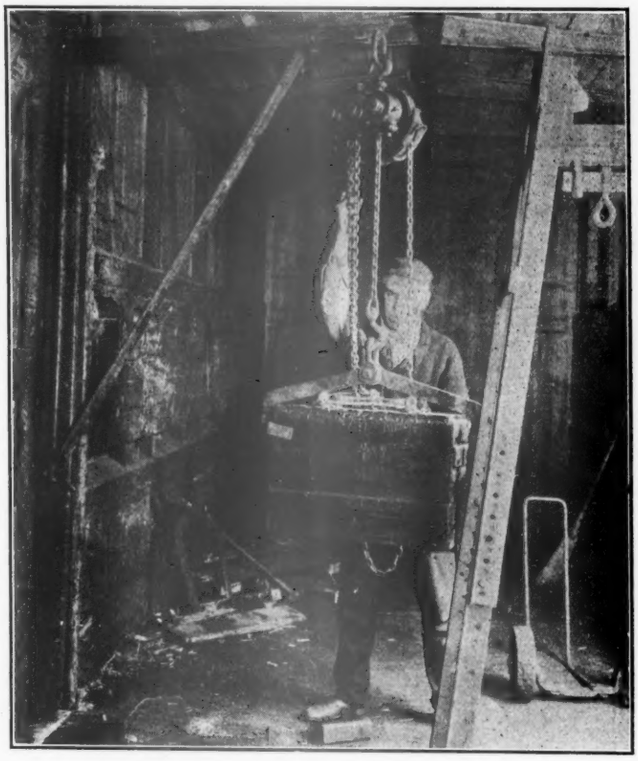


Fig. 2.—On the Left is the Bracket Crane for Loading or Unloading Batteries. On the Right is the Extension of the Track System from the Battery House

post in Fig. 3, consists of a block of three short sections that can be lined up for any desired move.

Five sets of ½-ton chain hoists, as illustrated in Fig. 3, are used to lift the battery and carry it about the shop. Special tongs or clamps are used to pick up the batteries, one size being made for the two-cell and another for the three-cell crates.

Progress of Battery Through Shop

When a car load of batteries requiring general repairs arrives at the shop the "Overway" track is extended into

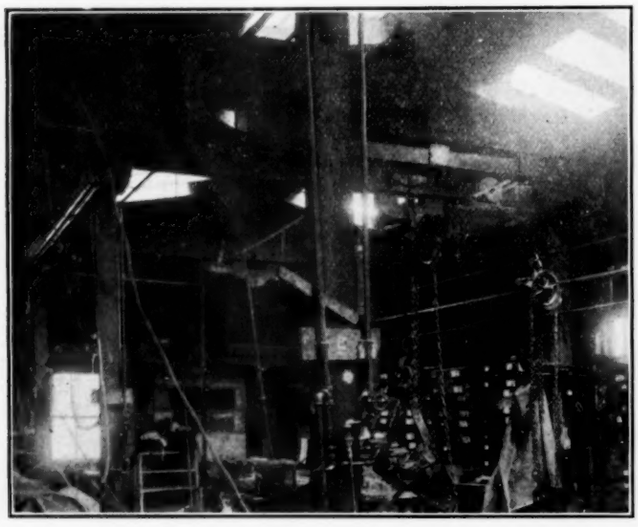


Fig. 3—The Over-Way Track System, Together with the Switching Apparatus is Supported from Overhead Beams

the car as shown to the right in Fig. 2. The small truck is used to haul the battery to the door where it is picked up by the clamp and chain hoists. The battery, by means of the "Overway" system, is then placed on the floor at one side of the room, as shown in Fig. 4. At this point a deep galvanized iron cover fitted with a steam connection is placed

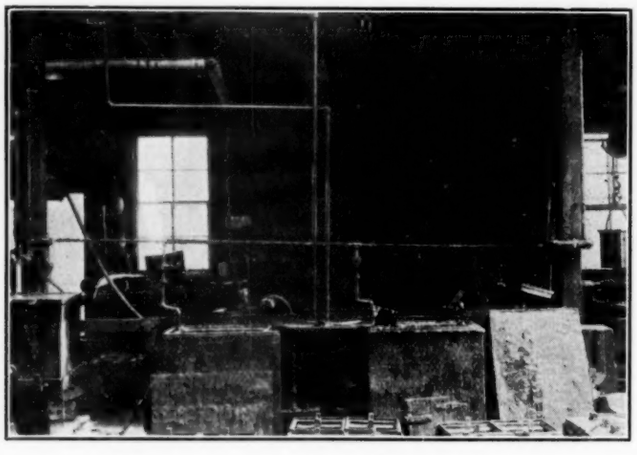


Fig. 4—A Corner of the Room Showing Wax Vats and Storage Space in Foreground

over the battery and the steam soon loosens the wax holding the battery cover, which is then removed.

The battery is taken to the washing bench shown in Fig. 5, either by means of the "Overway" cranes or by the small hand truck. The plates are removed from the cell by the double hook shown hanging on the end of the bench, the hooks being slipped into the terminal holes. The plates and tanks are cleaned and washed in the usual manner; water pipes with hose connections extend down to the table from overhead. On the left of the bench, as shown in Fig. 6, are the valves for both air and water which lead to a special tank washing arrangement, consisting of coils of pipe with small holes, placed below the level of the top of the bench and arranged to wash either a two or three-cell crate. A press for straightening the plates, operated by an air-cylinder, is shown to the right in the rear. The cells are reassembled, using such material as has been reconditioned for service, i.e., tanks, plates, separators, etc.

The tanks are floated into the crates in wax, and this wax must be warmed to remove the tank; this is done by a large steam heated cover which is placed over the crates. The tank is then pulled out of the crate by placing a block of wood

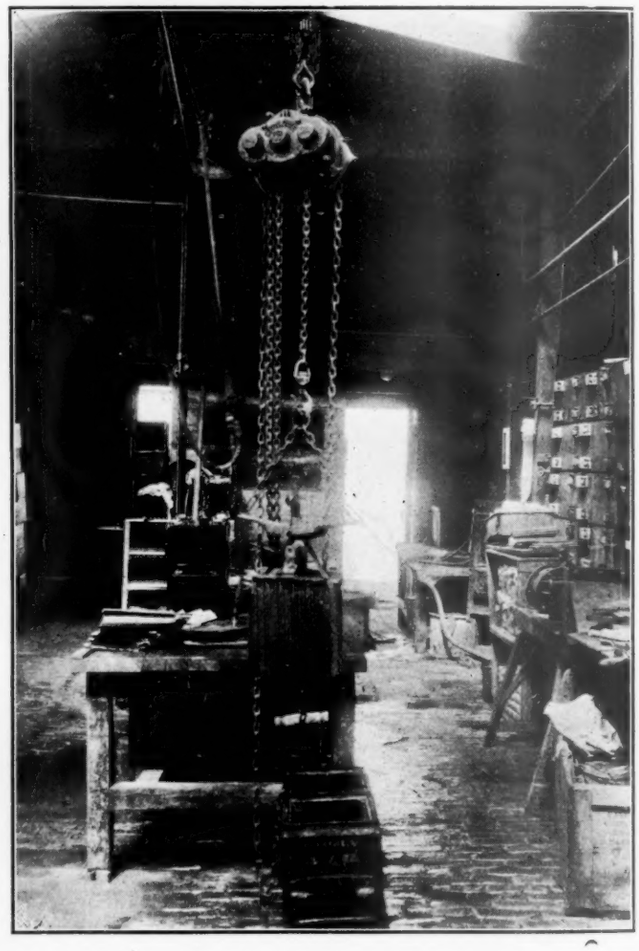


Fig. 5—Battery Washing Bench. Note Special Clamp for Holding Canvas Strip That is Used to Hold the Assembly of Plates When Lowering Them into Tank

across the top and using the clamp and hoist as shown in front of the window, to the extreme right of Fig. 4. The majority of the tanks in service are lead, however, and as they become worn out they are being replaced in sets by the rubber jars.

The repair of the lead tanks is done at the other end of the shop. The tanks are straightened and repaired by fitting them over a box mandrel which is covered with sheet iron; this is shown in Fig. 7. After repairing, each tank is tested by filling with water and allowing a small amount of steam to condense in the water thus causing a vibration which locates any leak quickly. On the box below the tank is shown the slotted crate for holding the battery plates while making

repairs; oxy-acetylene torches are used to make these repairs.

After the crates and tanks are ready for service the tank is floated in the crate in hot wax, which when hardened makes a tight unit of the crate and tank. The crates are then piled up ready for assembly as shown in Fig. 6.

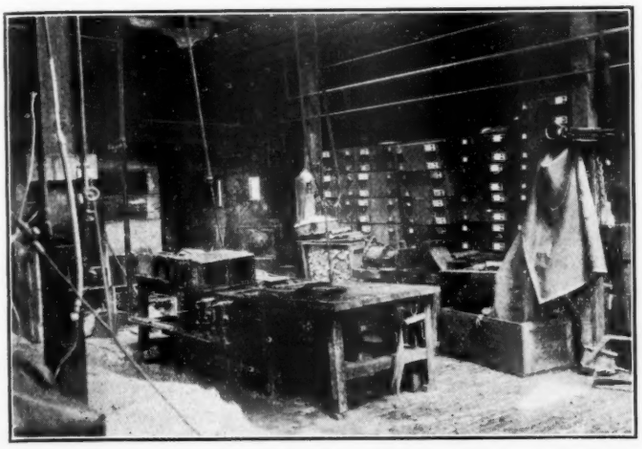


Fig. 6—Battery Washing Bench and Air Press for Straightening Plates

New material or overhauled parts are used when the cells are assembled. They are placed on the charging benches where the cell is filled with electrolyte that has been tested. After charging and testing, the covers and connectors are

Fig. 7—The Lead Tanks are Repaired over Mandrels

bolted and burnt on. The battery is then numbered, dated and marked ready for service.

Charging Equipment

A motor-generator set is used as a source of power for charging batteries, the generator having a capacity of 177 amp. at 85 volts normally. A charging board consisting of six panels was placed in service recently. It includes a voltmeter and an ammeter for the total generator load. Ammeters on each of the six separate circuits indicate the rate of charge or discharge. In addition to the set of carbon pile rheostats each panel has an overload and a no-load automatic release circuit breaker. The circuit breaker is so designed that with the handle thrown up the circuit is on charge but with the handle thrown down the circuit is on discharge through the carbon pile resistances. The six charging circuits terminate in long flexible leads as shown over the battery charging benches in Fig. 3.

The battery is first given a complete charge, the time varying according to its condition. Then the acid is standardized. A complete discharge is then taken on an eight-hour rate. Separate cell readings are taken and recorded. On any cell not meeting the requirements a cadmium reading is taken to determine whether the positive or negative group is at fault and the defective group is then removed and replaced. After the discharge test, they are recharged and sealed.

When a complete set of faulty negative groups has been removed they are rejuvenated and placed in stock for future use.

Good Results Accomplished

With a force of four electricians, including the lead working foreman and three helpers, this shop is overhauling on an average of 24 sets of batteries a month; a set consists of 16 crates of two-cell capacity, or its equivalent in three-cell crates. One month in particular, 31 sets of batteries were overhauled. This work is done under the direction of L. S. Simms, electrical foreman at the Aurora shop.

If the Miners Strike

WASHINGTON, D. C.

IN THE EVENT of a strike in the anthracite coal mines on September 1, the railroads would probably be called upon to handle approximately 1,000,000 tons per week of bituminous coal during the balance of the year in excess of the normal requirements for bituminous, to provide substitutes to the users of anthracite, according to estimates made by the United States Coal Commission in connection with the policy adopted by the government for meeting a strike by promoting the distribution of substitutes. According to the commission's figures, the anthracite mines to date have maintained such a rate of shipment that by September 1 more than 25,000,000 tons of domestic sizes of anthracite will be in the possession of the consumers or dealers. This supply, representing shipments from April 1 to August 31, is 7,000,000 tons more than was distributed by December 31 last year and only about 17,000,000 tons less than the average supply on December 31 of the three years previous to the strike year. Any complete stoppage of anthracite mines on September 1, the commission says, would thus involve a deficit of 17,000,000 tons of domestic sizes to be made up before the end of December or 1,000,000 tons a week.

"In the event of an anthracite strike," the commission says, "a household fuel emergency would exist in the eastern United States, which the bituminous operators believe can be promptly met by utilizing the excess mine capacity of the bituminous fields normally shipping steam coal to New England, Canada and the Atlantic seaboard. The united effort of soft coal operators, railroad executives and the Interstate Commerce Commission would probably be in the line of starting this movement of coal before the period of maximum freight movement which the railroads are reported to be in excellent condition to handle."

Plans have been made in conference between the American Railway Association, the federal fuel distributor, F. R. Wadleigh, and the Interstate Commerce Commission for the movement of additional quantities of bituminous coal

through unaccustomed channels to the points ordinarily served by the anthracite mines and the Interstate Commerce Commission has given consideration to the preparation of the priority orders that might be considered necessary. The terms of office of the United States Coal Commission and of the federal fuel distributor expire by law on September 22, but it was stated officially at the White House that the services of the fuel distributor would be continued as an agent of the Interstate Commerce Commission, which has authority under the law to issue priority orders. The function of the federal government is to see that the coal is distributed to the various states, distribution within the borders of the states being the function of the state authorities in the various states.

Although the federal government accepted the co-operation of Governor Pinchot of Pennsylvania in a further effort to bring about an agreement between the coal operators and the coal miners, the government's policy has been based mainly on the theory that the best way to prevent a strike is to forestall the possibility of serious effects.

The National Coal Association, which represents bituminous operators, had worked out a detailed program for distributing bituminous coal as a substitute for anthracite. As this plan was outlined before a committee of the Massachusetts legislature by President John C. Brydon of the coal association, the program would be directed by the executive officers of the association, under whom would be a general manager of production and distribution, working under the general supervision of the federal government authorities and with representatives in every producing district and in each state in which the emergency existed. Paralleling this organization would be a transportation organization to be supplied by the American Railway Association.

From January 1 to August 20, this year 17,876,979 tons of bituminous coal were transported by rail and dumped into vessels at Lake Erie ports for shipment up the lakes, according to reports compiled by the Car Service Division of the American Railway Association. This is the largest amount of coal dumped at Lake Erie ports during any corresponding period in the past six years. Total tons of bituminous coal dumped into vessels from January 1 to August 20 in previous years were as follows:

1923	17,876,979
1922	4,955,455
1921	15,438,046
1920	9,649,929
1919	15,093,906
1918	15,301,666

Bituminous coal dumped into vessels during the week which ended on August 20 totaled 18,748 cars, compared with 3,290 during the corresponding week last year, when the miners' strike greatly curtailed coal shipments. The total for the week of August 20 this year also surpassed the corresponding week in 1921 by 6,456 cars, but was 3,081 cars under the corresponding week in 1920.

Reports to the Car Service Division also show that from January 1 to August 18, inclusive, 126,973 car loads of bituminous coal were shipped by rail to New England points, while rail shipments of anthracite coal destined for New England during the same period amounted to 120,035 cars.

All rail shipments of bituminous coal during the corresponding period in previous years have been as follows:

1923	126,973 cars
1922	56,899 cars
1921	103,370 cars
1920	129,740 cars
1919	101,368 cars

All rail shipments of anthracite coal to New England points from January 1 to August 18 during the past three years have been as follows:

1923	120,035 cars
1922	50,560
1921	99,409

In addition 7,267,292 gross tons of bituminous coal were dumped at tidewater for shipment by water to New England during the first seven months this year. Except in 1918, when this total was exceeded by 296,286 gross tons, this is the largest amount of bituminous coal dumped at tidewater for shipment to New England during any corresponding period in the past six years.

Bituminous coal dumped at tidewater during the first seven months in previous years as been as follows:

1923	7,267,292 gross tons
1922	5,846,718 gross tons
1921	3,881,378 gross tons
1920	5,199,640 gross tons
1919	4,173,136 gross tons
1918	7,563,578 gross tons

Reading Litigation Terminated

WASHINGTON, D. C.

ATTORNEY GENERAL DAUGHERTY announced on August 27 that he had decided not to appeal to the Supreme Court from the decree entered by the United States district court at Philadelphia on June 28, last, in the case of United States v. Reading Company, et al., under the anti-trust law. This suit was instituted in 1913 and had for its purpose the segregation of the Reading Company, the Philadelphia & Reading Coal & Iron Company, the Philadelphia & Reading Railway Company, the Central Railroad Company of New Jersey and the Lehigh & Wilkes-Barre Coal Company, all of which were combined through the Reading Company, a holding corporation.

Final dissolution of this combination was ordered by a decree of the district court dated June 6, 1921. Certain common stockholders of the Reading Company appealed from that decree on the ground that it gave the preferred stockholders an unlawful preference in the distribution of assets. The Supreme Court on June 1, 1922, affirmed the decree of the district court in all respects save one. The only modification made by the Supreme Court was to decree a separation and division of the Reading Company general mortgage.

What the Decree Provides

The decree of June 28, 1923, from which no appeal will be taken, provided that instead of a segregation of burden and liability under the general mortgage as between Reading Company and the Philadelphia & Reading Coal & Iron Company, those companies will execute new separate mortgages and issue 5 per cent bonds thereunder in exchange for outstanding general mortgage bonds.

The mandate of the Supreme Court under which the district court proceeded conferred on the latter authority to fix in its discretion the compensations of the bondholders. The district court after hearing all parties in interest divided the general mortgage into two separate mortgages, one to be assumed by the coal company and one by the railroad company and fixed the terms thereof. This adjustment proved satisfactory to all interests concerned and effectually carried out the contention of the government and the decision of the Supreme Court that the anthracite coal trust should be terminated by separating the railroad and coal companies.

The determination of the attorney general to let the case stand on the decree of the district court brings to a close one of the most celebrated litigations under the anti-trust law. It was argued three times on the first appeal to the Supreme Court before a decision was reached, and was twice argued on the second appeal. In addition, several independent law suits have grown out of the proceeding between different interests affected by the segregation of these companies.

I. C. C. to Prescribe Depreciation Charges

Presidents' Committee Says Fixed Property Properly Maintained Not Subject to Depreciation

WASHINGTON, D. C.

THE INTERSTATE COMMERCE COMMISSION has been making a preliminary investigation of the subject of depreciation charges of steam railroad companies and has announced a series of hearings for the purpose of complying with paragraph 5 of section 20 of the interstate commerce act, as amended by the transportation act, 1920, in which the commission is directed, as soon as practicable, to "prescribe for carriers subject to this act the classes of property for which depreciation charges may properly be included under operating expenses, and the percentages of depreciation which shall be charged with respect to each of such classes of property, classifying the carriers as it may deem proper for this purpose."

The commission has organized a depreciation section in its Bureau of Accounts, and has instructed that section to make a preliminary investigation in the case of each class of carriers and to report its tentative conclusions and recommendations following this preliminary investigation. Such report is to be used in each case as the basis for public hearings at which all interested parties will be given opportunity to submit evidence in support of or in opposition to the recommendations contained in the report, these hearings to be followed by the submission of briefs and oral argument, if it be desired, before division 4 of the commission.

In accordance with this plan, the commission has published the report of the depreciation section with reference to the depreciation charges of steam railroad companies, including comments on a report made by a committee of railway accounting officers. The conclusions and recommendations in this report are merely the tentative conclusions and recommendations of the depreciation section, prepared as a basis and nucleus for public hearings, and the commission is in no way permanently committed to these conclusions and recommendations.

A public hearing upon the subject matter of this report will be held at the offices of the commission in Washington, beginning October 1, before Examiner Fowler, at which hearing opportunity will be afforded for the presentation of evidence. The data accumulated in connection with the preliminary investigation of the depreciation section will be made a part of the record in this proceeding. In addition to the matters discussed in the report of the depreciation section, the commission desires consideration of the following questions:

1. Has a depreciation reserve any other purpose than to provide a means of equalizing the effect of property retirements, so that a disproportionate burden may not fall upon the operations of any one year? If so, what other purpose or purposes has it?

2. If a depreciation reserve has no other purpose than that above stated, will the method of determining depreciation charges which is recommended by the depreciation section provide a reserve which is no larger than is necessary for such purpose?

3. Should amounts reserved as the result of depreciation charges from what would otherwise be surplus earnings be segregated in a special fund, to be invested in whole or in part in liquid assets, so that companies may be in a position to make necessary or desirable replacements of property even when not in a position to market new securities on advantageous terms?

4. Does the straight-line method of determining depreciation charges, as compared with a sinking fund or annuity method, result in larger charges than the public served can equitably be asked to pay?

5. Is it practicable and desirable, in addition to accounting for depreciation, to prescribe an accounting rule under which carriers will be required to show, for each month or year, the extent to which proper maintenance of the property has been deferred?

Tentative Report of Depreciation Section

Following is an abstract of the report of the preliminary investigation and the tentative conclusions and recommendations of the depreciation section:

The effective classifications of operating expenses contain accounting rules which provide for depreciation charges as a part of operating expenses. The instructions with respect to such charges outline the principles upon which they should be based, but do not classify the property for depreciation purposes or specify the percentages of depreciation which should be applied to the different units or classes of property.

Under the provisions of the amendment the commission must prescribe the classes of property and the percentage of depreciation which shall be charged with respect to each of such classes. Carriers are forbidden to charge to operating expenses, or elsewhere, depreciation charges on classes of property not prescribed by the commission, or to employ percentages of depreciation other than those prescribed therefor by the commission.

In response to the commission's invitation the several carrier accounting and other associations, representatives of large individual carriers, state commissioners, and others interested in the question co-operated and much valuable data were secured. In addition, each carrier of every class was called upon to submit information based upon its past experience, as well as its views with respect to classes of depreciable property and percentages of depreciation.

Early in the investigation it became apparent that while the fundamental principles of depreciation were similar for all classes of carriers, the characteristics of each class necessitated separate consideration in the matter of application. It is proposed, therefore, to submit, separately, recommendations for each class of carriers and under this plan there is presented for the consideration of the commission the depreciation section's report of the preliminary investigation relating to steam railroads together with the tentative conclusions and recommendations for the regulation of depreciation charges which may be included in the operating expenses of that class of carriers.

As of December 31, 1921, there were 1,131 operating steam roads reporting to the commission, divided, for the purposes of the accounting regulations into the following classes:

Class I, comprising 192 roads having annual operating revenues of more than $1,000,000.

Class II, comprising 316 roads having annual operating revenues of from $100,000 to $1,000,000.

Class III, comprising 389 roads having annual operating revenues of less than $100,000.

Switching and terminal, comprising 234 roads.

These roads are practically all represented by the Railway Accounting Officers' Association. In response to the commission's invitation the accounting officers association, in conjunction with the Presidents' Conference Committee on Valuation, appointed a depreciation committee to report to the latter composed of J. J. Ekin, comptroller Baltimore & Ohio, chairman; W. B. McKinstry, comptroller Central of Georgia; F. W. Sweney, comptroller Northern Pacific, of the accounting officers, and C. S. Churchill, vice-president, Norfolk & Western; George W. Kittredge, chief engineer, New York Central, and H. C. Phillips, chairman, western group engineering committee, as engineering representatives of the presidents' committee. The committee was requested to submit its views with respect to the classes of depreciable property, average service lives and salvage values; the basis upon which depreciation charges should be accrued; and the method of determining the percentages of depreciation; also suggestions which in its judgment would be helpful to the commission in determining the final regulations.

Several meetings were held, some of which were attended by a

representative of the depreciation section, which finally led to the submission of the following report to the presidents' conference committee:

Report of the Committee on Depreciation Charges Under the Transportation Act of 1920

APRIL 6, 1921.

"To the Presidents' Conference Committee on Valuation:

"The committee appointed by you to consider the subject of depreciation charges under the transportation act of 1920, submits the following report:

"1. The depreciation accounts created under authority of the transportation act of 1920 should provide for retirement of property (not made in ordinary maintenance) out of current operating revenues through charges to operating expenses in anticipation of the extinguishment of the ledger value less salvage of such property when retired.

"2. Developments in the art of transportation frequently make it desirable to discontinue the use of certain types of property but the cause of retirement is not controlling in the setting up of depreciation accounts.

"3. In setting up depreciation accounts the rate recommended should be applied to the ledger value of the property during its entire life. When such property is retired from service, the ledger value, less salvage, should be charged against the reserve which has been created for the group of property to which it is allocated.

"4. Depreciation charges should be set up for groups of property under the following 'road' accounts and should be applied only to property or installations the minimum costs of which for roads of various classes as defined by the Interstate Commerce Commission are:

Class I roads	$50,000
Class II roads	10,000
Class III roads	5,000
Class IV roads	5,000
Switching terminal companies	25,000

"Depreciation charges under 'equipment' accounts should be applied without limitation as to minimum costs.

No.	Road account title.	Rate.
5	Tunnels and subways (for perishable material only	Timber, 6 per cent
6	Bridges, trestles and culverts	Steel structures, 1½ per cent; masonry bridge structures, 1 per cent; masonry and steel structures, 1½ per cent.
7	Elevated structures	Do.
14	Snow and sand fences and snowsheds	Masonry structures, 1 per cent; frame, 6 per cent.
15	Crossings and signs	Steel structures, 1½ per cent; masonry bridge structures, 1 per cent; masonry and steel structures, 1½ per cent.
16	Stations and office buildings	Metal, 1½ per cent; frame, 2 per cent; masonry, 1 per cent.
18	Water stations	4 per cent.
19	Fuel stations	Do.
20	Shops and engine houses	2 per cent.
21	Grain elevators	Masonry, 1 per cent; wood, 4 per cent.
22	Storage warehouses	Frame, 2 per cent; masonry, 1 per cent; metal, 1½ per cent.
23	Wharves and docks	Masonry, 1 per cent; timber, 2 per cent.
24	Coal and ore wharves	Masonry, 1 per cent; timber, 2 per cent; metal, 1½ per cent.
27	Signals and interlockers	4 per cent.
28	Power-plant dams, canals and pipe lines	1 per cent.
29	Power-plant buildings	2 per cent.
30	Power-substation buildings	Do.
31	Power-transmission systems	Do.
32	Power-distribution systems	Do.
33	Power-line poles and fixtures	Metal, 3 per cent; wood, 5 per cent.
35	Miscellaneous structures	Frame, 2 per cent; masonry, 1 per cent; metal, 1½ per cent.
44	Shop machinery	5 per cent.
45	Power-plant machinery	6 per cent.
46	Power-substation apparatus	5 per cent.
	EQUIPMENT ACCOUNTS	
51	Steam locomotives	4 per cent.
52	Other locomotives	Do.
53	Freight-train cars	Do.
54	Passenger-train cars	Do.
55	Motor equipment of cars	Do.
56	Floating equipment	Do.
57	Work equipment	Do.
58	Miscellaneous equipment	Do.

"5. The plan as suggested lends itself to simple and direct accounting and avoids the many involved transactions necessary under any plan which attempts to assign current accruals of depreciation charges to specific units of property."

The presidents' conference committee declined to approve this report, on the theory that the property of a steam road properly maintained is not subject to depreciation, and returned it to the depreciation committee for further consideration. The depreciation committee was unable to accept this theory and again endeavored to have the report approved by the presidents' committee, but was unsuccessful, except with respect to equipment. As a result of this disagreement the presidents' committee on January 6, 1922, took the following action:

"Resolved, That it is the sense of this committee that depreciation charges be confined to equipment, and that it is the purpose of this committee, to whom this subject has been committed, to invite discussion and hearing before the appropriate body, the Interstate Commerce Commission, in furtherance of the principle expressed in this resolution, in connection with the interrogatory (1) of the Interstate Commerce Commission, dated December 20, 1921."

The interrogatory referred to is the questionnaire which was sent to all steam roads by the depreciation section.

Carriers' Committee on Depreciation

After the presidents' conference committee had rejected its depreciation committee's report and had adopted the resolution previously quoted, the depreciation section made an effort to secure from the presidents' committee a written statement setting forth its views in support of the principles expressed in the resolution. The effort was only partially successful. On August 16, 1922, T. W. Hulme, vice-chairman of the presidents' committee submitted printed copies of testimony presented to the commission at hearings embracing various valuation dockets on March 23, 1917, by Julius Kruttschnitt, chairman, Southern Pacific, and on June 18, 1917, by W. B. Storey, vice-president, Atchison, Topeka & Santa Fe, accompanied by a letter in which Mr. Hulme stated that he thought the statements included in their testimony "fairly represent the reasons which prevailed in the presidents' conference committee as to why it is not essential nor advisable to create a so-called depreciation fund for the renewal or replacement of the fixed physical property of railroads."

The recommendations of the steam roads depreciation committee with respect to depreciation of fixed property having been rejected by the presidents' conference committee, the depreciation section is left without that helpful information or constructive criticism it expected to receive from that source. It is significant, however, that the views set forth in the depreciation committee's report represent the unanimous opinion of its membership, which comprises six railroad officials who have had technical experience in the accounting and physical phases of the problem. Since approval of the committee's report is withheld, not because of the classes of property designated as depreciable, but rather on the theory that depreciation charges are not applicable to fixed property, there is no good reason why the depreciation committee's recommendations may not be accepted as a basis for consideration in determining the classes of fixed property subject to depreciation charges and the percentages of depreciation which may be applied thereto.

Individual Companies

The action of the presidents' conference committee in rejecting the proposals of its depreciating committee has resulted in very little information being submitted by individual companies with respect to depreciation of fixed railroad property. As previously stated, there were 1,131 steam railroad companies reporting to the commission at the close of 1921, 1,041 of which have responded to a form of questionnaire containing eight questions designed to elicit information concerning classes of depreciable property used in their service; the cost or inventory values thereof; the average service lives and estimated salvage values of such property; the basis upon which these data were determined; the percentages of depreciation used in past years; their bases; the adequacy or inadequacy of such percentages; and whether or not it would be practicable, in each respondent's judgment, to adopt uniform rates for the different classes of steam railroad property which would be applicable to all steam railroad companies.

An analysis of these returns discloses that practically all carriers have classified equipment as depreciable property. Three hundred and eighty-seven carriers believe that all fixed property should be regarded as depreciable; 324 believe that it should not be so regarded; 330 are noncommittal. Of these companies, 635 have not accrued depreciation on their fixed property, 182 have accrued charges on certain units peculiar to their individual lines or for particular reasons, and 224 did not furnish the desired information. While a number of companies have submitted data as to average service lives, estimated salvage values and depreciation percentage rates as applicable to fixed property, they can not be considered representative for comparative purposes because they apply to dissimilar classes of fixed property of different individual companies.

With respect to equipment, 758 companies have given average service lives, 732 have shown estimated salvage values, and 782 have shown percentages of depreciation. The remaining respondents either submitted no specific information or failed to make any response.

Original unit costs of both fixed property and equipment are available from 551 companies as the basis for depreciation computations, while in the case of 294 companies appraised or inventory values must in part be employed. One hundred and ninety-four companies have not furnished the information.

Depreciation percentages have been based on individual unit observations by 98 companies, on an estimated basis by 683, and on financial necessities by 29. Belief is expressed by 657 companies that depreciation rates used by them in past years have been adequate, 141 companies believe their rates have been inadequate, and 243 companies do not express an opinion. According to the responses of 137 companies it is practicable to adopt uniform rates of depreciation, if climatic conditions and standards of maintenance are considered, while 575 companies express the opinion that it is impracticable to adopt such rates.

Statement of the Depreciation Section

The rejection of the report of the steam roads depreciation committee by the presidents' conference committee is based on the theory that the fixed property of a steam road does not depreciate if properly maintained. This theory was first presented to the commission during the preliminary investigation of the depreciation question in connection with the uniform system of accounts for steam roads which became effective July 1, 1907. At that time the arguments in support of the theory were not sufficient to justify the exclusion of accounting provisions for depreciation charges, and the accounting classifications of operating expenses which were promulgated as a part of that system contained mandatory rules requiring charges to operating expenses for depreciation on equipment.

Later, when consideration was being given to a revision of these classifications, the extension of the rules to include charges in operating expenses for depreciation on fixed property was opposed on the same theory. The commission again rejected the theory and incorporated in the revised issue of the classifications rules for depreciation charges on fixed property, but instead of making the accounting for such depreciation mandatory left it optional with carriers until the commission should otherwise direct. Apparently this optional accounting created an erroneous impression in the minds of the carriers. Indications of such an impression will be found in the testimony of Mr. Kruttschnitt before the commission on March 23, 1917, wherein he said substantially, in discussing depreciation on fixed property, that the commission would hardly have left it optional with the carriers to charge depreciation had it considered that the property was depreciating.

The testimony submitted by the presidents' committee undertakes to show that piecemeal renewals and replacements made in current maintenance when and as required eliminate depreciation and thus perpetuate the service life of the property. It goes without saying that maintaining property in a high state of repair will prolong its service life and retard depreciation while the opposite practice will shorten such life and accelerate depreciation, but maintenance, however efficient, can not prevent its ultimate retirement. As a matter of fact railroad facilities are retired because they have ceased to render the service required of them or have reached a point where their further use has become uneconomical. In other words, their service value has diminished to the zero point, and this despite the degree or character of related maintenance.

The presidents' conference committee seems to have assumed an inconsistent attitude in the position it has taken. On the one hand it contends that depreciation should not be charged on fixed property because proper maintenance eliminates the necessity for such charge, while on the other hand the committee concedes the propriety of charging depreciation on equipment. Fixed property and equipment are, of course, two different types of railroad property, but certain types of fixed property as well as equipment suffer from the lapse of time, either by exposure to the elements or from use, and become obsolete by progress in the art of railroad transportation. If maintenance perpetuates the existence of one it must have the same effect on the other. Both must be maintained to function efficiently, but notwithstanding this both ultimately disappear, so that in the end maintenance can not eliminate depreciation.

As an accounting requirement depreciation charges have a two-fold purpose: First, that such charges shall be included as a part of operating expenses, so distributed that each month shall bear its proportionate share of the cost of the property consumed in operation during its service life; and second, that concurrent with the inclusion of such charges in operating expenses there shall be accumulated a depreciation reserve, to which shall be charged the loss represented in the retirement of the property. In other words, the object is to reserve from free surplus the expired service value of the property and provide in the assets amounts adequate to cover the cost of the investment in such property at the time of its retirement; or where the company is not earning a surplus which can be so used, to show by the accounts the real extent of the operating deficit.

If, therefore, the investment in the property is to be kept unimpaired, so that at the end of any given term of years the investment remains as it was at the beginning, some theory of the progress of the gradual exhaustion of the service value of the property must be assumed to provide in the accounts for the integrity of the investment. Otherwise, not only will the investment become impaired, but the current operating expenses will not be truly stated.

In determining annual depreciation charges, the nearest approach to accuracy may be found by estimating the total service of life of each class or like units of property based upon experience of the past and all known facts, as well as future probabilities, and distributing the cost, less the estimated salvage value, in equal proportions to operating expenses over each year of the total service life.

It is evident from the recommendations of the steam roads depreciation committee that it recognizes these principles. It is also evident that the committee concedes the practicability of applying these principles to many classes of fixed railroad property, and when it is remembered that the recommendations represent the unanimous views of those who are qualified by their training and experience to express such views, the fact that the presidents' committee has withheld its approval does not affect the value of the information submitted in this investigation.

Comments on Railroad Committee's Report

The depreciation committee's recommendation in paragraph 1 of its report is believed to be the proper function of such accounts and is in accordance with the principles underlying the commission's effective accounting regulations.

Paragraph 3 recommends that when property is retired from service the service value—that is, the ledger value less salvage recovered—should be charged to the reserve created for the group or class of property which includes the property unit retired. Under this plant the service value of the unit retired would be charged to its respective depreciation reserve regardless of any insufficiency of depreciation charges accrued against it to provide for such loss.

For example, station and office buildings comprise a class of property composed of many units of different types and construction and having varying estimated service lives. If a building of a certain type should be retired before the expiration of its estimated service life the difference between the depreciation accrued to provide for its retirement and the amount actually needed therefor must necessarily be taken from the accruals applicable to other buildings comprised in the same group. Since these accruals are represented by corresponding charges to operating expenses, it follows that unless the aggregate of such charges is equivalent to the exhausted service value of the property when retired, operating expenses will not have borne the real cost of the property consumed in operation. Conversely, if the property remains in service beyond its estimated service life the depreciation charges thereon will continue until such time as the property is retired, and consequently operating expenses will be charged in excess of the amount actually required.

The commission's effective accounting rules recognize this and provide that when the accrued depreciation on a unit of property is insufficient to equal its expired service value when retired and replaced, the difference between such accruals and the expired service value shall be charged to operating expenses. On the other hand, if a unit of property continues in service beyond its estimated service life, depreciation charges with respect to that unit cease at the expiration of such life, hence in the event the property is retired and replaced operating expenses are charged with no more and no less than the cost of the property consumed in operation. If, however, the property is retired and not replaced, the difference between the depreciation accrued and the expired service value is chargeable to profit and loss.

The fixed property designated by the committee is classified according to the captions, appropriate to such property, contained in the classification of investment in road and equipment which became effective July 1, 1914.

For the purposes of discussion and as a matter of convenient reference the property named by the committee, as well as all other property enumerated in the aforesaid classification, will be divided into three groups: First, the physical property that may be satisfactorily individualized and for which it is practicable to establish a unit as the basis for depreciation charges; second, the physical property that cannot be satisfactorily individualized and for which it is impracticable to establish a unit as the basis for depreciation charges; and, third, other property investment items which include charges incident to or in connection with the construction or acquisition of the property in groups one and two.

The depreciation committee recommends that all of the property enumerated in the first group be considered depreciable except roadway buildings, gas-producing plants, and roadway machines. It is not clear why these were omitted, since such property is, in

common with all other classes of property in group 1, exposed to the same elements of depreciation and can be as readily individualized for depreciation purposes. Nor is it clear why the committee differentiated between power-transmission systems, power-distribution systems, and power-line poles and fixtures, which it included in its list of depreciable property, and telegraph and telephone lines, underground power tubes, and underground conduits, which it omitted.

Since the property represented by the three last-named classes is similar in general character and construction to power-transmission systems, power-distribution systems, and power-line poles and fixtures, it is logical to assume that if depreciation charges are applicable to one they are applicable to the other.

Because these particular classes of property are continuous structures, it is impracticable to treat them as units of property for the purpose of establishing a basis of accruals or to isolate portions of them for classification as depreciable units. However, there seems to be no reason why such accruals cannot be ascertained by the use of a formula which may be uniformly applied by all carriers with just and equitable results. Such a formula is submitted for consideration in the latter part of this report.

It is, therefore, believed that the classes of fixed property recommended by the depreciation committee, with the addition of roadway buildings, gas-producing plants, roadway machines, telegraph and telephone lines, underground power tubes, and underground conduits, should be designated as the fixed property of steam roads for which depreciation charges may properly be included in the operating expenses of that class of carriers, with the understanding, of course, that the minimum, hereinafter referred to, should be applied to each unit or class of property in the computation of such charges.

In confining depreciable fixed property to the classes recommended by the depreciation committee with the additional classes just mentioned, the fact has not been overlooked that there are other classes of property, especially in group 2, subject to depreciation. With the exception of the investment in grading, ties, rails, other track material, ballast, and track laying and surfacing, the property in question is relatively such a small proportion of the investment that the basis for depreciation accruals would undoubtedly fall below the minimum which it is hereinafter proposed to apply.

Grading, ties, rails, other track material, ballast and track laying and surfacing are the component parts of the roadway and track. Grading compacts and forms a more stable foundation for the track in the years succeeding construction. The fact that it improves with use would place it outside the class of depreciable property. Ballast becomes pounded down, disintegrates and disappears. Ties become unserviceable from exposure to the elements, and rails and other track material deteriorate principally from wear and tear. Track laying and surfacing represents charges incurred in the application of ballast, ties, rail and other track material includable in property investment account.

The vast number of items comprised in roadway and track and their constant renewal and replacement makes it practically impossible to individualize them for depreciation accounting purposes on a unit basis. To determine whether or not depreciation is properly accounted for and is distributed uniformly over the life of the property to which it relates, consideration necessarily must be given to the ledger value of the depreciable item and to its estimated life. The total number of ties, or tons of rail, or of track fastenings, or of cubic yards of ballast in a carrier's property cannot for the purpose of recording depreciation charges be treated as a unit in the aggregate. Retirements and renewals of constituent parts are constantly occurring. To attempt to identify original cost of each retired part and thus record the resultant changes in property investment account is not feasible.

It is, therefore, not a question of the existence of depreciation with respect to this class of property, but rather one which appears to have no practicable accounting solution as to a proper basis for the accounting for depreciation charges. For these reasons, only, ties, rails, other track material, ballast and track laying and surfacing are omitted from the classes of the fixed depreciable property of steam roads.

It is pertinent here to call attention to the fact that the omission of these classes of property must not be construed to be in conflict with or adverse to the principles underlying the classification of depreciable property by the Bureau of Valuation for valuation purposes. The engineer in valuing the property of a railroad after an inspection of the property states the depreciation percentage, if any, of the grading, ties, rails, other track material and track laying and surfacing upon each valuation section, each as a separate piece of property. Where this detailed information is not available or when conditions arise making it impracticable to determine the condition of such separate pieces of property, the engineer *may*, after an inspection of the property, combine the grading, ties, rails, other track material and track laying and surfacing upon one valuation section and treat them as a single piece of property in stating depreciation.

Thus while there is unanimity of opinion in the belief that all classes of physical property of steam roads, with the exception of grading, are subject to depreciation, there is no practical method of accounting for depreciation charges on the classes of property it is proposed to omit.

The classes named in the third of the foregoing groups constitute a set of accounts in which are recorded amounts expended incident to or indirectly connected with the cost of the physical property, such operations of the property as may be carried on during the construction period, the acquirement of other operated lines, and the rehabilitation of such lines to conform to the standard maintained by the purchasing company. While these items are represented in the capital outlay, fundamentally they are of great diversity and are not sufficiently homogeneous to be susceptible of the application of a uniform rate of depreciation. It is, therefore, believed that the charges to the property account which they produce should not be classified as depreciable under section 20 as amended.

The depreciation committee's recommendation that all classes of equipment should be depreciated is sound and should be adopted. It is in effect a recommendation of the continuance of an accounting requirement that has been in effect for the last 15 years, a requirement that has demonstrated the practicability and the reasonableness of providing for current depreciation charges.

As to the committee's recommendation (par. 4) that a minimum cost of fixed property should be observed in assigning depreciation charges, it is believed that a reasonable minimum should be established unless there be good reason for a different treatment.

There are many units in the fixed property of steam roads the costs of which are relatively small, and unless provision is made to exclude the accrual of depreciation charges on such units there will necessarily be undue accounting refinements that will serve no useful purpose. It is believed, however, that the minima recommended by the steam roads depreciation committee are excessive and that their application would have the effect of eliminating from operating expenses depreciation charges on many items of property investment that ought to be included.

The depreciation committee's recommendation that depreciation charges should be accrued on equipment without limitation as to minimum cost is in accordance with the commission's effective requirements. The units comprised in this class of property are such as to make practicable the assignment of depreciation accruals to each unit or series of units.

The Unit Plan

The primary purpose of accruing depreciation charges in the accounts is to see that operating expenses are charged with the current loss resulting from depreciation of the property in service. In ascertaining these charges by far the nearest approach to accuracy is obtained by using, as a base, the unit cost of the property to be depreciated. It is then necessary to determine the average service life and the estimated salvage value of all units of the same kind or series, but not necessarily of the same cost, to obtain the percentage rate of depreciation to be applied to the unit cost. The percentage rate represents the annual charge for depreciation applicable to the depreciating unit. Thus it is obvious that operating expenses is charged with no more than is necessary to create a reserve adequate to provide for the retirement of the unit. Under the plan proposed by the committee the cost of all units of the same general character without regard to kind are combined and their aggregate cost determined as the depreciation base for the group. Thus a company possessing steel, wood, or stone bridges would take their combined cost as the basis of a uniform depreciation rate applicable to all three types.

Service lives and salvage values are, of course, determined as under the unit plan. The percentage rates obtained therefrom are then weighted into a composite rate which is applied to the group base. The charges thus obtained represent depreciation, not on any given unit, but upon a group of units having varying estimated service lives and salvage values.

operating expenses and create a depreciation reserve, the adequacy

While this method would provide for depreciation charges to or inadequacy of such expenses or of such reserve would be difficult, if not impossible, of determination. There is no reason why the accounting should be more simple or direct in the one case than in the other, and while the group basis proposed by the depreciation committee may, to some extent, reduce the actual number of items, such reduction obviously must be made at the expense of accuracy. The practicability of the unit plan, in accounting for depreciation on equipment, has been demonstrated for a number of years. There appears to be no reason why it should not be just as practicable when applied to classes of fixed property.

While the steam roads' depreciation committee has recommended that depreciation charges be assessed for certain classes of fixed property and all classes of equipment, and have suggested the percentages of depreciation applicable to each of the several classes of property, it has not stated that the percentages suggested are, or are not, applicable to all steam railroads, nor has it indicated the basis for the percentage rates it recommends. It is silent as to the method by which the depreciation charges should be accounted for.

With respect to uniform rates of depreciation for the several classes of railroad property the responses of the individual carriers in their replies to the questionnaire furnish the only expressions of opinion. Of the total number of carriers (1,041) filing responses, 55 per cent contend that no percentages of depreciation can be fixed which would be fairly applicable to all carriers, 13 per cent believe that uniform percentages can be determined provided consideration is given to climatic conditions and standards of maintenance and 32 per cent do not express an opinion.

Climatic conditions vary to such an extent in the different sections of the country as to render a percentage of depreciation applicable to fixed property determined to be equitable for one section inadequate or excessive in another. The country-wide interchange of freight train cars would seem to neutralize to a great extent the particular effect of sectional climatic conditions on that class of property. There is no recognized uniform standard of railroad maintenance, hence consideration of this factor must be confined to the standard set by each individual carrier.

It is obvious, therefore, that there can be no specific rates of depreciation fixed for all classes of property of all carriers if such rates are dependent on factors such as the foregoing. In view of this it may be said that the carriers are practically unanimous in their views that it is impracticable to determine a percentage of depreciation for the same units or classes of property that would be fairly applicable to all railroad companies.

The investigation has developed nothing to controvert this view. Methods of construction, climatic conditions, standards of maintenance, classes of traffic handled, the topography of the sections of the country through which the roads operate, and public demands are all factors which cannot be harmonized, and consequently make impracticable the establishment of uniform rates of depreciation.

It is, therefore, recommended that each carrier subject to the jurisdiction of the commission be required to determine the percentages of depreciation for such of the units or classes of its depreciable property which are included in the list of such property hereinafter proposed, and to submit such percentages to the commission for examination and approval, before being made effective, accompanied by sworn statements showing in detail the methods and bases used in their ascertainment.

Service Life and Salvage Value

It is obvious that before a fair or reasonable rate of depreciation can be ascertained carriers must make a systematic determination of service lives and salvage values. Observation or estimates upon any other basis are largely a matter of individual judgment. This is apparent from the data submitted to the depreciation section, which shows that of the total number of carriers filing responses to the questionnaire with respect to percentages of depreciation on equipment, 13 per cent have based such percentages on unit or class observations and 87 per cent on estimates. That there is no uniformity in the bases used appears evident from the fact that steam locomotives are shown to have a service life of from 4 to 55 years; other locomotives from 5 to 45 years; freight train cars, wood, from 3 to 60 years; freight train cars, steel, from 8 to 50 years; passenger train cars, wood, from 5 to 66 years; passenger train cars, steel, from 5 to 50 years; motor equipment of cars, from 3 to 50 years; floating equipment, from 4 to 84 years; work equipment, wood, from 5 to 60 years; work equipment, steel, from 5 to 50 years; and miscellaneous equipment, from 2 to 40 years. Salvage values are shown to vary from 1.5 per cent on other locomotives to 33 per cent on steel work equipment. The average percentage rates of depreciation on the above equipment from 1907 to 1920, inclusive, for the railroads as a whole, are for steam locomotives, 4.2 per cent; other locomotives, 4.2 per cent; freight train cars, wood, 4.6 per cent; freight train cars, steel, 3.9 per cent; passenger train cars, wood, 4 per cent; passenger train cars, steel, 3 per cent; motor equipment of cars, 5.9 per cent; floating equipment, 4 per cent; work equipment, wood, 4.8 per cent; work equipment, steel, 4.8 per cent; and miscellaneous equipment, 16.2 per cent. Similar data relating to fixed property show equally different service lives and percentages, but inasmuch as such data are submitted by relatively few carriers they ought not to be accepted as representative.

While the carriers collectively and individually recognize the fact that depreciation charges are an essential part of operating expenses, they do not offer any recommendations as to the method of accruing such charges. It is obvious that the actual amount of these charges cannot be accurately forecast, but it is inevitable that unless some estimate of the current loss from depreciation is included in operating expenses they will be understated and the net income correspondingly overstated.

Hence there should be determined, preferably on an actuarial basis, the service life of the carrier's physical property, and provisions should be made in the current operating expenses to record charges, as nearly accurate as may be, representing the loss from depreciation, apportioned to each month during the service life of the property so that at the end of such life there will have been accumulated a reserve equal to the service value or the cost of the expired service value when the property is retired.

As a means of accomplishing this end various methods have been advocated from time to time. Mention will be made here of only three of these methods, namely, the annuity, sinking fund, and straight-line methods. (Here the report discusses the three methods in detail.)

The complexity of depreciation accruals on the diversified properties of common carriers, which involves different amounts maturing at irregular intervals, together with the fact that the annuity and sinking-fund methods do not afford a true measurement of the annual loss of property consumed in operation, would seem to justify the recommendation that they be not adopted for use in accounting for such loss on the property of the common carriers subject to the jurisdiction of the commission.

In contrast to the methods which involve interest consideration the straight-line method is clear cut, practicable, and simple in its application. Under its provisions operating expenses are charged with the accrued loss representing consumption of property in operation or, in other words, with the accrued depreciation, representing the loss of service value, in equal annual installments. No questionable accounting is involved and no restrictions are placed upon the use of the carriers' funds.

The method has been indorsed by leading accountants, courts and regulatory bodies that have been called upon to determine a plan for depreciation accounting. It is the plan which underlies the commission's present accounting regulations with respect to depreciation. It is recommended that the straight-line method be adopted.

Conclusions

After a careful study of the results of the preliminary investigations the depreciation section has reached the following conclusions:

1. That charges to operating expenses to offset depreciation should be confined to tangible physical property.
2. That such property should be divided into two parts for depreciation accounting: (*a*) Property that can be individualized and on which depreciation charges can be accrued on a unit basis; (*b*) continuous structures which from their nature cannot be individualized, but on which it is practicable to assess depreciation charges by proper groups in their entirety.
3. That the cost of the property to the accounting company plus the cost of additions and betterments thereto, less its salvage value, should be the basis for depreciation charges.
4. That depreciation charges should be assessed only during the service life of the property depreciated.
5. That no service lives, salvage values, or percentages of depreciation applicable to the various units or groups of property can be determined that will be equitable or reasonable for all steam roads or for such carriers by groups, states, sections, or territorial divisions.
6. That the straight-line method of distributing depreciation charges should be adopted because of the simplicity and practicability of its application to all units or classes of property and its equitable distribution of such charges.
7. That a minimum cost, including additions and betterments of each unit or class of fixed property, should be established in assessing depreciation charges.
8. That uniform rules for the regulation of depreciation charges which will be applicable to all steam roads can and should be promulgated.

Based upon these conclusions the following recommendations are submitted for the consideration of the commission:

General Rules Recommended

1. For the purpose of these regulations the term "depreciation charges" shall be construed to mean the estimated loss in tangible physical property due to wear and tear not restored by current maintenance, the effects of age and decay, and the decrease in the service value due to obsolescence, inadequacy, changes in the art, and public requirements. They shall not include any charges representing the removal costs incident to or in connection with the retirement of property (whether replaced or not).
2. The term "ledger value" shall be construed to mean the value at which the property is carried in the property investment account in the general ledger of the carrier.
3. The term "service life" shall be construed to mean the period of time between the installation of the property affected and the date of its retirement.
4. The term "salvage value" shall be construed to mean the amount received for the property retired and disposed of, or the amount representing the second-hand value if suitable for reuse.
5. The term "service value" shall be construed to mean the difference between "ledger value" (the original cost of the property involved plus the additions and betterments thereto, including the applicable proportion of interest during construction), and the estimated salvage value at the time of retirement. It is the cost of the investment which must be provided for through depreciation charges. If the ledger value cannot be ascertained or is not shown

separately in the ledger, the ledger value of that item shall be its proportionate share of the ledger value of the entire group in which the particular property is included.

6. Depreciation charges shall be based upon the service value of the class of property as above defined.

7. Depreciation charges shall be computed separately for each unit or class of property at the percentage rates which shall hereafter be prescribed therefor and shall be distributed under the straight-line method to operating expenses during the estimated service life of the property or as much thereof as may be consumed at retirement, if such retirement takes place prior to the expiration of the estimated service life.

8. Steam roads shall not charge to their operating expenses or otherwise depreciation charges in any form on any unit or class of property other than that prescribed herein, or charge to any unit or class of property a percentage of depreciation other than that prescribed therefor.

9. Depreciation charges shall be accounted for in accordance with the requirements of the accounting regulations in effect at the time these regulations shall become effective or any amendments of any accounting regulations with respect thereto which hereafter may be promulgated.

10. If after six months from the date these regulations become effective any steam road shall find the percentages of depreciation which have been prescribed to be at variance with its requirements or necessities, as nearly as may be ascertained, it may apply to the commission for a modification of the percentages so prescribed. Such applications, however, must in each case be accompanied by sworn statements of the facts, and by the expert opinions and estimates upon which are based the application for a modification of the percentage rates.

11. Each steam road shall keep its records in sufficient detail to show fully all facts pertaining to all depreciation charges, the ledger value of the classes or units of property named herein, the cost of all additions and betterments made thereto, and the application of the percentages of depreciation prescribed therefor. If full information is not recorded in the controlling records, such records shall contain sufficient references to the details to permit ready identification and shall be filed in such a manner as to be readily accessible for examination by representatives of the commission.

12. Steam roads shall include in operating expenses charges representing depreciation by units on the following classes of property:

GROUP A.

FIXED PROPERTY

Tunnels and subways.	Wharves and docks.
Bridges, trestles and culverts.	Coal and ore wharves.
Elevated structures.	Gas producing plants.
Snow and sand fences and snow-sheds.	Signals and interlockers.
	Power dams, canals, and pipe lines.
Crossings and signs.	Power plant buildings.
Station and office buildings.	Power substation buildings.
Roadway buildings.	Miscellaneous structures.
Water stations.	Roadway machines.
Fuel stations.	Shop machinery.
Shops and enginehouses.	Power plant machinery.
Grain elevators.	Power substation apparatus.
Storage warehouses.	

EQUIPMENT.

Steam locomotives.	Motor equipment of cars.
Other locomotives.	Floating equipment.
Freight train cars.	Work equipment.
Passenger train cars.	Miscellaneous equipment.

Also charges representing depreciation by groups on the following classes of fixed property:

GROUP B.

Underground power tubes.	Power distribution systems.
Telegraph and telephone lines.	Power line poles and fixtures.
Power transmission systems.	Underground conduits.

Units or classes in Groups A and B may be further subdivided by any carrier for its individual purposes provided the approval of the commission is first obtained. Applications for permission to use such subdivisions must be filed in the office of the depreciation section, bureau of accounts.

Percentages of Depreciation

The accounting carrier shall submit to the commission the percentages of depreciation which the company deems applicable to each of such units or classes of property herein prescribed as may be included in its service. Such percentages shall be based upon a study of the company's history and experience.

The commission, upon consideration and analysis of the carriers' proposals, will classify the carriers and determine the classes of depreciable property and the percentages of depreciation applicable thereto for each class of carriers, and these shall remain in effect as thus determined until changed or modified by the commission.

Each carrier shall submit with its proposed percentages sworn statements showing the bases therefor and the method employed in ascertaining the percentage for each unit or group of property.

In applying the annual percentages of depreciation to the ledger value of the unit or group of fixed property being depreciated, carriers shall not compute depreciation charges for such units or groups the ledger value of which is less than $1,000. No minimum shall be observed in applying percentages of depreciation to units of equipment.

Property Depreciable on Unit Basis

The annual percentage of depreciation as to each *unit* of property shall be determined as follows:

Determine the average service life of each unit and ascertain the ratio which each year bears to the total number of years embraced within such service life. Then ascertain the ratio which the estimated salvage value of the unit bears to the ledger value and divide such ratio by the number of years contained in the service life.

The difference between the two ratios thus obtained is the annual percentage of depreciation which shall be applied to the ledger value of the unit being depreciated as set forth in the example following unless otherwise ordered by the commission.

A freight-train car, the ledger value of which is $1,000, is estimated to have a service life of 20 years. Each year's ratio is therefore one-twentieth, or 5 per cent.

The salvage value is estimated to be $200, or 20 per cent of the ledger value, the yearly salvage ratio, therefore, being 1 per cent.

The difference between the two yearly percentages, or 4 per cent, represents the annual depreciation rate which should be applied to the ledger value ($1,000), producing a depreciation charge of $40 per year for the estimated life of 20 years.

At the expiration thereof the total depreciation accrued is $800, the entire service value of the unit.

Property Depreciable on Group Basis

The annual percentage of depreciation for each group of property shall be ascertained as to each year by the following formula:

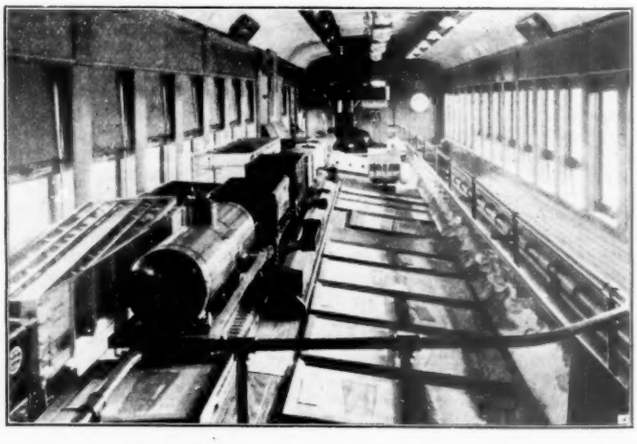
After the service life of each group of property has been estimated, ascertain by groups of property the total amount of actual retirements and the total amount of salvage for a period immediately preceding the effective date of these regulations which shall contain the same number of years as is embraced within the estimated service life of each group. Obtain therefrom the average amount of annual retirements and the average amount of annual salvage by classes.

The ratio which the average annual amount of retirements, less the average annual amount of salvage, bears to the ledger value of the group of property retired shall be the percentage of depreciation applicable to that group of property for the first year subsequent to the effective date of these regulations.

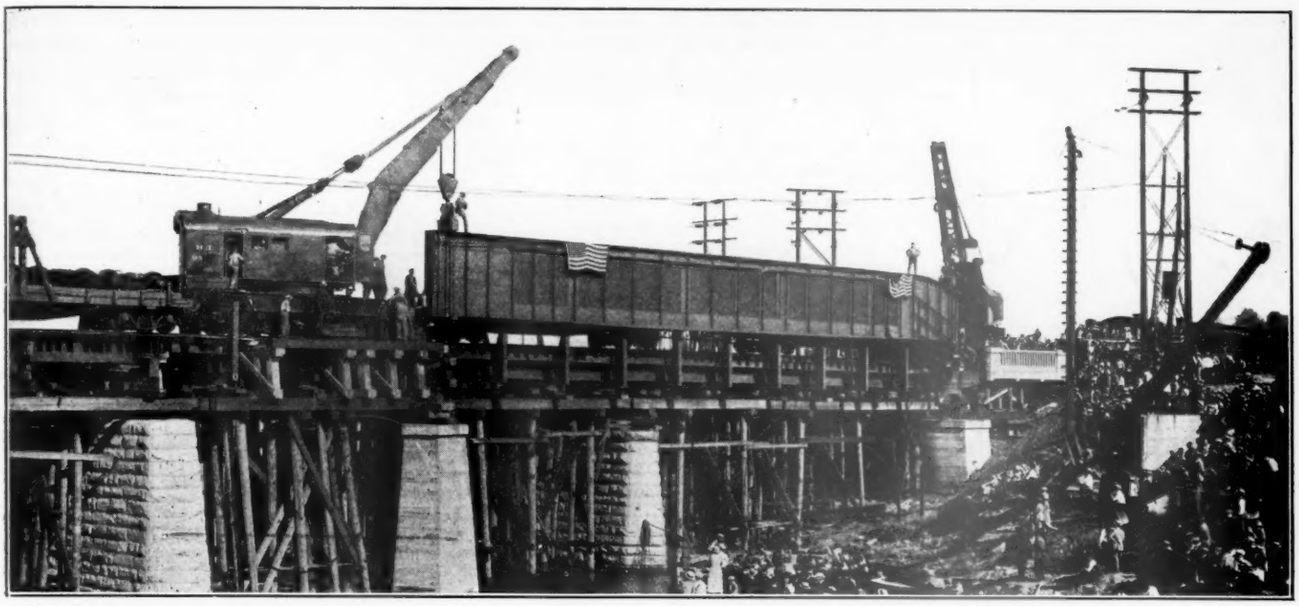
Thereafter ascertain the percentage of depreciation for each group of property, for each year, by the same process, but in so doing deduct from the totals of the original basic period the amount of actual retirements and the amount of actual salvage for the earliest year included in such period and add to the remainders the amount of actual retirements and the amount of actual salvage for the year next preceding the current year.

The percentages thus obtained for each group of property shall be the percentages of depreciation for the current year, unless otherwise ordered by the commission.

At no time shall the number of years in the basic period exceed or be less than the number of years covered by the estimated service life.



Interior of Car Showing Freight Car Models—the New York Central's "Service-Progress" Special



A Large Crowd Witnessed the Placing of the Long Girder

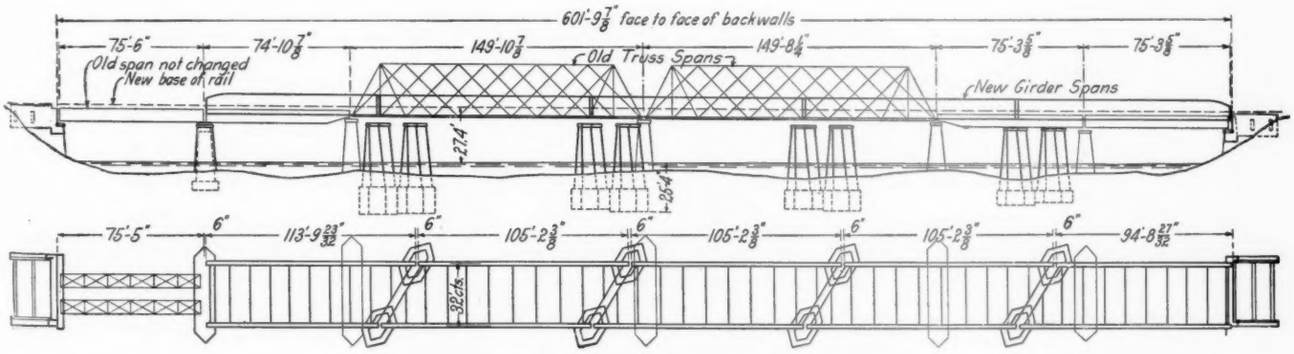
Rock Island Uses Long Girders in New Bridge

Many Problems Encountered in Renewing Structure Without Interference With Train Movements

On August 25, one of the longest and heaviest plate girders ever used in a railroad bridge was erected at Rock Island, Ill.; this is the first of 10 large through plate girders to be placed in a double-track bridge of the Chicago, Rock Island & Pacific over Sylvan Slough. The placing of this record bridge member was marked by suitable ceremonies which were witnessed by nearly 2,500 people of Rock Island and Moline, Ill., and Davenport, Ia., special trains being run to accommodate them. The girder placed last Saturday is 114 ft. long, 11 ft. deep, and weighs 97 tons. The bridge, when completed, will contain one other girder of this length, six girders 105 ft. 2 in. long, and two girders 94 ft. 3 in. in length, these 10 girders being used in 5 new double-track spans replacing all of the superstructure of an old bridge built in 1893, with the exception of one span at the west end which will remain in place.

The Rock Island bridge over Sylvan slough, is in reality a part of its crossing over the Mississippi river, since the slough is a branch of the main stream. It is separated from the main channel by a large island which is the property of the United States government and the site of the Rock Island arsenal. The railroad traverses the lower end of this island for a distance of about a mile between the slough bridge and the so-called government bridge over the Mississippi river, which is a double track railway-highway bridge owned jointly by the government and the Rock Island.

Interest in the new Sylvan Slough bridge is restricted by no means to the fact that two of the girders involved are of record proportions, for their use involved formidable problems of erection and transportation, while the need of avoiding interruptions to traffic called for measures both novel and ingenious that also merit attention. The handling of some 300 train and engine movements across this bridge in the course of each 24 hours, together with the fact that a detour over the "Crescent" bridge of the Davenport, Rock Island & North Western, which crosses the river about a mile to the south would have involved a delay of some two to three hours, made it imperative that traffic over the Rock



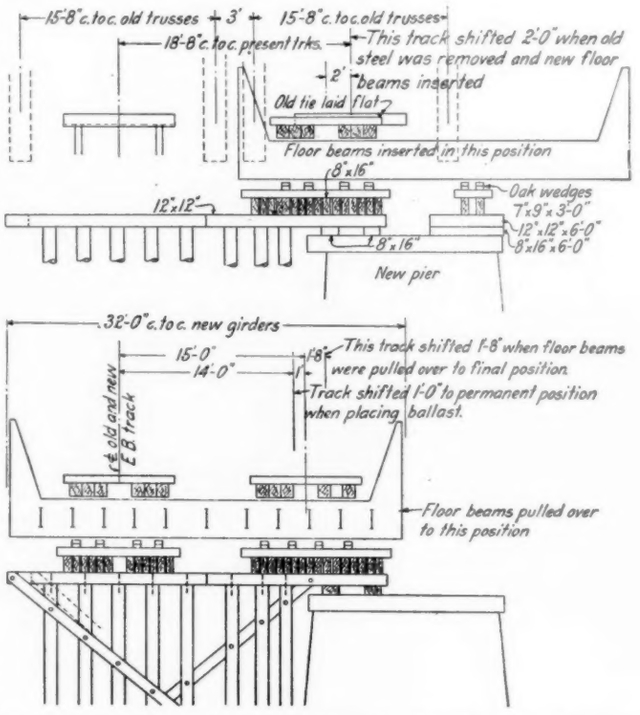
General Plan and Elevation of the New and Old Bridges

Island bridge be maintained without interruption, and the entire erection program was conducted in a manner that insured continuous service over at least one track at all times during the working hours, and over both tracks during the remaining portion of the day. The operation of some 40 to 45 trains across the bridge daily during the working hours throughout the entire construction period was effected without any delay whatever.

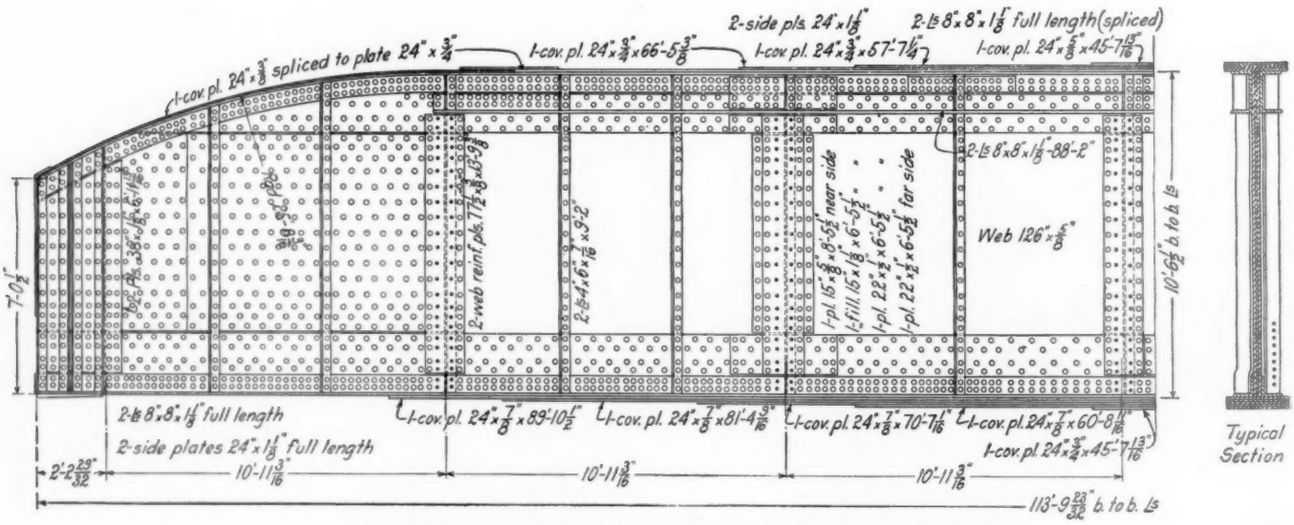
The old bridge, which consisted of duplicate parallel single-track structures comprising two riveted lattice truss spans flanked at each end by two deck plate girder spans, is being renewed because of obsolescence of the old superstructure, the old spans, designed for a working load consisting of one 85-ton locomotive followed by a corresponding train load, having proved inadequate for present-day equipment. To secure approval for the design of its new structure, the railroad was required to provide a span arrangement which called for an entirely new substructure within the established channel width of the stream. Because of the construction of a dam and power plant at the north end of the government island, Sylvan slough is virtually the tail race from the power plant turbines, and the old piers having been placed square with the track in its skew crossing the stream, were considered to comprise such an obstruction to the flow that the railroad was required to replace them with new piers located parallel with the direction of the slough or on a skew of 5.8 deg. 35 min.

A further complication was introduced by the fact that no part of the old piers could be incorporated in the new substructure although the old ashlar masonry was in a good state of preservation. Plans for the future use of the waterway as a transportation channel, call for dredging to such depth below the bed of the stream as to raise serious question concerning the stability of the old piers under such conditions. Accordingly it was necessary to carry the new pier footings to a considerably greater depth, a condition which pointed to the desirability of selecting span lengths and locations such that the new piers could be placed with as little interference as possible with the old masonry. As shown on the plans, the new bridge comprises three skew spans of 105 ft. 2 in. and two end spans skewed at the inner ends and square at the outer ends, thus requiring longer girders on one side than on the other. To reduce the amount of masonry required, the long new piers have been divided into two pedestals, centered under the lines of the girders along each side of the bridge respectively.

The superstructure of the new bridge consists of two lines of girders 32 ft., center to center, connected by floor beams spaced 10 ft. 11 3/16 in., center to center, which in turn are connected by 11 lines of I-beam stringers which will carry a solid floor of creosoted plank for a ballasted deck. A total of 131,000 ft. b.m. of lumber will be required for this floor, while 1,600 tons of steel is used in the new superstructure which is designed for E-65 loading. The girders required under the conditions imposed are obviously heavy. The webs are 5/8-in. thick, while the main flange angles are 8 in. by 8 in. by 1 1/8 in. thick with cover plates 24 in. wide and side plates 24 in. by 1 1/8 in. The top flange near the center is also reinforced with two additional 8-in. by 8-in. flange angles placed in a reversed position as shown in the drawing. The rivets are all 1 in. in diameter, many of them having a 6-in. grip. All holes were drilled from the solid through the assembled material.

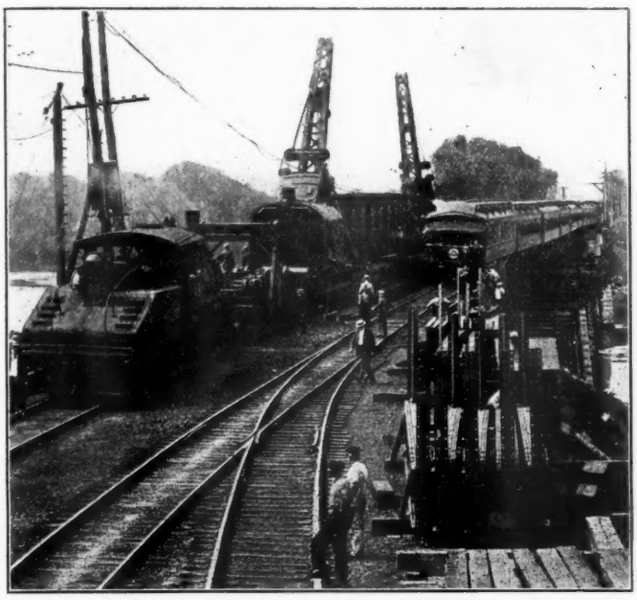

15'-8" c. to c. old trusses
3'
15'-8" c. to c. old trusses
18'-8" c. to c. present trks.
This track shifted 2'-0" when old steel was removed and new floor
2' beams inserted
Old tie laid flat
Floor beams inserted in this position
8"x16"
12"x12"
Oak wedges
7"x9"x3'-0"
12"x12"x6'-0"
8"x16"x6'-0"
18"x16"
New pier
32'-0" c. to c. new girders
15'-0"
14'-0"
1'8"
This track shifted 1'-8" when floor beams were pulled over to final position.
Track shifted 1'-0" to permanent position when placing ballast.
℄ old and new E.B. track
Floor beams pulled over to this position

A Diagram Illustrating Two Steps in the Erection Program



Part Elevation and Typical Section of the 114-ft. Girder

The transportation of the girders from the plant of the fabricator, the Fort Pitt Bridge Works, Pittsburgh, Pa., to Rock Island, was a formidable problem in itself. The 114-ft. girders were loaded on two 30-ft. artillery cars with two idler cars of the same type between them. In order to lower the center of gravity of the load as much as possible to meet the



Colorado Limited Crossing the Bridge Just Before the Girder Was Placed

requirements of the railroad from Pittsburgh, all of the top cover plates of the girders were shipped bolted to the sides of the bottom flange instead of being riveted in place on top of the top flange angles.

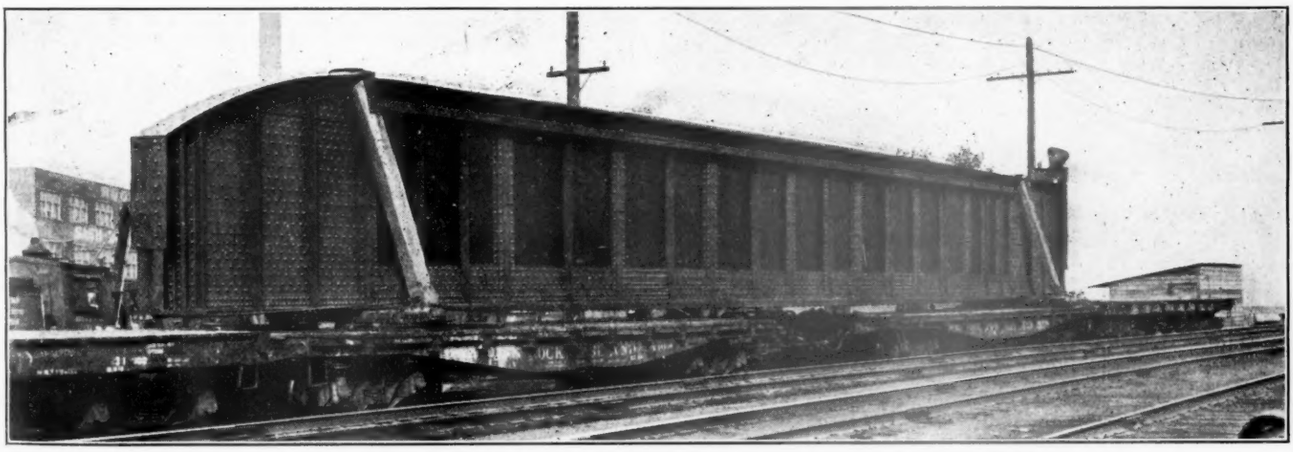
This introduced a complication, in that the assembling and riveting of these plates had to be done in the Rock Island yard at Silvis, Ill., 8 miles from the site of the bridge where the girders were stored until erected, and in order that the flange rivets could be given the value of shop rivets, it was necessary that the driving of all of these rivets be done with a pneumatic pressure riveter. This work was all done by the bridge erecting force of the railroad with a machine supplied by the fabricator. This riveter was suspended from the boom of a locomotive crane operated over a track alongside the girders in the yard. With this arrangement the work was done expeditiously and with a degree of economy approaching that obtained under shop conditions. For the purpose of erection, the girders had to be reloaded on flat cars with an overhang of several feet at each end to allow the erecting equipment to approach sufficiently close to the girder to obtain as short a boom hitch as possible.

An interesting feature in the erection was introduced by the fact that the tracks of the old bridge were spaced 18 ft. 8 in., center to center, to accommodate the two single-track through truss spans, but under the plan of erection adopted this proved an advantage instead of a handicap since it permitted the erection of the double-track floor beams without disturbing more than one track at the time. The first step in the erection plan was to place the old bridge on falsework so as to permit the release of the old trusses. This done, the north track was cut and the old deck girders and the old floor system of the truss spans under this track were removed to permit the placing of the new floor beams in an offset position with the south girder connection gussets projecting upward in the space between the two tracks. Coincident with this change, the north track was moved two feet closer to the south track.

As each floor beam was placed, the track was replaced, supporting it on shallow wooden stringers spanning across the new steel.

After a considerable number of the new floor beams were placed and with the north track in operation, the south track was broken, the old steel under it was removed and the new floor beams shifted across so as to come under the south track and within one foot of final position. This operation did not disturb the north track because it was possible to jack up the track over each of the floor beams in turn to clear the steel without any interruption to traffic. That this operation did not offer any interference with the movement of trains over the north track is indicated by the fact that in one period of 1 hr. and 15 min. during which this work was in progress, 17 trains were passed over the north track.

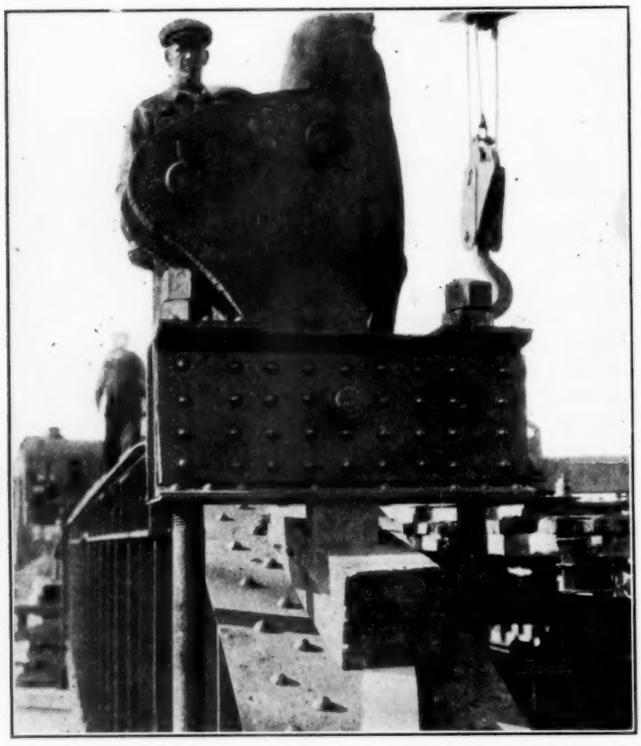
The next step was the erection of the first girder, being the one in the east span on the south side of the bridge. This involved the delivery of the girder to the bridge on flat cars from which it was lifted, swung out the distance of 9 ft. and lowered into position on the bearing castings. Two 150-ton railroad wrecking derricks were used for this purpose, the lifting being done with the aid of lifting rigs attached to the ends of the girder. These consisted of two 3-in. dia. rods extending down either side of the girder and through a heavy billet or forged slab spanning crosswise under the bottom flange, the tops of these rods being connected over the top of the girder by a structural steel yoke in turn connected with a pair of forged plates provided with two pins for convenient connection to the double hooks with which the wreck-



The Long Girder As Loaded Ready to Be Run on to the Bridge

ers were equipped. The raising of the girder, swinging it out and lowering it occupied 30 min., but much of this time was taken in the conduct of various features of the celebration, shifting of the moving picture cameras, etc.

The placing of these girders was greatly facilitated by the fact that the floor beams were one foot to the north of final position, thus offering no interference with the lowering of the girder. The next operation will involve the shifting of these floor beams to the south for the purpose of effecting connections with the girder. The procedure for the erection of the other four girders on the south side of the bridge will correspond exactly to that obtaining in the erection of the first one, but the placing of the girders on the north side of the bridge will involve an additional complication in that the girders must be lowered outside of the final position in order to clear the ends of the floor beams and then be shifted southward approximately one foot to bring them to



Top of the Lifting Rig by Means of Which the Wreckers Picked Up the Girder

bearing against the floor beam connection. The erection of the north girders will be followed by the placing of the stringers, the plank floor and ballast.

The design and construction of the new bridge has been under the direction of C. A. Morse, chief engineer of the Chicago, Rock Island & Pacific, and I. L. Simmons, bridge engineer, both of Chicago. The work has been under the direct supervision of Hans Bober, engineer in charge at Rock Island, while the erection of the steel work is being handled under the immediate supervision of H. E. Davis, steel erection foreman.

ABOLITION OF GRADE CROSSINGS in Los Angeles, Cal., and vicinity was discussed at a conference in that city on August 21. It was decided that a second meeting would be held on August 30 at which time representatives of each railroad would submit a list of five crossings; and at a third meeting two crossings on each road will be selected for elimination; and the ways and means of accomplishing their removal will be discussed.

Examiners Against Proposed Electric Line

WASHINGTON, D. C.

DENIAL of the application of the Staley System of Electrified Railway to the Interstate Commerce Commission for a certificate of public convenience and necessity authorizing the construction and operation of approximately 1,240 miles of electric railway in Arizona, New Mexico, Colorado and California, is recommended by Attorney-Examiner J. H. Agate and Engineer-Examiner E. Gray in a proposed report made public by the commission on August 27. The examiners recommend denial of the application on the ground that public convenience and necessity has not been shown and that, taking the line as a whole, it appears that the applicant has grossly overestimated the traffic possibilities and its estimate of revenues was excessive and operating expenses relatively much too low. The proposed main line would extend for 745 miles from a point on the boundary between Mexico and Arizona to a northern terminus on the Colorado-Utah boundary. Various other branches in Arizona, New Mexico and California are proposed, and in addition a line in Mexico of 66½ miles, making the total 1,307 miles.

The estimated cost was given as $76,024,236 and it was represented that subscriptions for $40,000,000 of stock had been procured, payable on call of the board of directors provided the application was granted, but the report says that the applicant was unwilling to disclose at the hearing the identity of the subscribers and that no application for authority to issue any stock had been filed. It was also stated that no survey or regular engineering reconnaisance appears to have been made by or for the applicant, although it had presented a condensed profile showing grades as indicated by available altitude records. Detailed estimates of the revenues, expenses and traffic possibilities were submitted with the application and at the hearing. These indicated, according to the report, an operating ratio for the first year of 31.2 and the fifth year of 28.9, whereas, in the opinion of the examiners, it is certain that the ratio would be much higher.

"Whatever may be the merits of electrical operation as applied to the proposed line," the examiners say, "it could not bring economies as great as the applicant estimates in relation to steam operating costs. In spite of long and heavy grades necessitated by the character of the country, the applicant estimates its operating expense per ton mile at less than half of the average ton mile operating expenses for the railroads of the United States in 1922 and at about 40 per cent of the operating expenses per ton mile for the Santa Fe in that year."

The report says that the applicant gave much weight to a peculiar labor policy as conducive to effective and cheap operation. As declared in the articles of incorporation, this policy is to favor the open shop, pay wages 10 per cent in excess of union scales as long as the employees do not organize and as long as employees of connecting lines do not refuse to handle interchange traffic, to give to the employees one-half of the profits above 8 per cent and, under conditions, to distribute the remaining profits in excess of 8 per cent in the form of stock dividends, using the money for additions and betterments. The applicant's estimate of traffic assumed that there would be a great increase in population, that many new towns would spring up and that there would be an extensive expansion of agriculture, timbering, mining and industry along the route if the road were constructed.

However, the examiners find that the experience of other roads in that region indicates that generally such growth and development would be slight.

Conference Board Issues Report on Railroads

Finds Situation Critical—Criticizes Rates and Reports on Other Phases of Problem

THE NATIONAL INDUSTRIAL CONFERENCE BOARD has issued a report of its recent investigation of railroad conditions in which it says that the roads are facing a crisis which during the next few months may determine their success or failure. The board says that its investigation was undertaken solely in the public interest and that its experts have studied the problem unhampered by prejudices of any kind.

The report examines in some detail the present railway situation, giving the causes, viz., government control, the shop strike, inadequate returns, over-regulation, etc.

The report suggests some reforms and makes some criticisms of the present rate situation, saying that it is impossible completely to divorce consideration of rates and service. The whole basis of rate-making, as laid down in the Transportation Act, it says, may be impossible of accomplishment without unfairness to some of the roads and their owners. Present rate schedules are characterized as unfair, on account of some of the handicaps suffered by the roads and enumerated in their list of ailments. Arbitrary rate changes on the Interstate Commerce Commission's frequently criticized "horizontal basis" are also assailed as ground for railroad difficulties, and in their stead there is suggested a scientific basis for rate fixing. Those communities now favored by present rates would do their share of protesting, it is asserted, but the benefits to the whole country would outweigh them.

The report pays considerable attention to the proposed federal plan of consolidation, and a previous report of the board was devoted to this question last November. An obstacle to proper consolidation, it says, lies in the fact that many smaller lines and branches have been so crippled by the popularity and economy of motor truck haulage and jitney-bus travel that it is doubtful if any scheme would make them pay.

Suggestions for the improvement of the railroads include a better and more standardized system of shop operation, proper division of highway taxes so that motor truck owners and railroads should pay their fair share, better relations with employees and closer relations with the public. The report finds that the railroads have failed to sell themselves properly to the public, in the face of great efforts which it was hoped would result in a better understanding.

The report follows in part:

A discussion of the immediate causes of the failure of the railroads to provide adequate service in recent years will help in an understanding of the present situation. The principal criticisms against the service of the railroads have been that a shortage of freight cars has existed from time to time and that shipments have been unduly delayed. Since the principal causes both of the shortage of cars and of delays to shipments arise from identical conditions, the two may be discussed together.

[The report here discusses the effects of federal control, the depression of 1921, the shop strike, the car shortage and the coal strike.]

Shippers' Practices

Whatever may be the responsibility of railroad management or labor for the unsatisfactory railroad service, the shippers are responsible for certain practices which react unfavorably upon the efficient operation of the railroads. Many shipments made under "to order" bills of lading are held in the cars for long periods until a buyer is found for the shipment, or because the buyer lacks the credit to lift the consignment. Frequently also when traffic is heavy many consignees do not have sufficient warehouse room to care for all the freight which is consigned to them, with the result that the freight is not unloaded until the consignee finds warehouse room for it. Moreover, the reconsignment privilege, by which the destination of a car may be changed en route, is a detrimental factor in car shortage and in railroad expense because it generally causes delay while the reconsignment is being made, and in many cases it necessitates hauling the car back over part of the route which it has already covered.

[The report here discusses the effect of repressive regulation and inadequate earnings on railway development.]

Railroad Valuation

The Railroad Valuation Act of 1913 instructed the Interstate Commerce Commission to investigate, ascertain, and report the value of all the property owned or used by every common carrier subject to the jurisdiction of the Commission, giving in detail the original cost to date, the cost of reproduction new, and the cost of reproduction less depreciation of each piece of property owned or used. This Act was passed through the efforts of certain members of Congress who believed the railroads to be over-capitalized; and it was intended to "squeeze the water" out of the railroad stocks. The valuation work has proceeded at great cost both to the government and the railroads and is now nearly complete. Final valuations of some railroads have been published and tentative valuations of many other railroads have either been completed or are nearing completion. With few exceptions, the figures published by the Commission show that the value of the railroad property used in the service of transportation is equal to or greater than the total capitalization outstanding against such property; in other words, that there is no "water" in railroad capitalization.

[The report here discusses the Transportation Act and recommends that it be given a fair trial.]

Basis of Rates

For rate-making purposes, the country is divided into four districts, in each of which the rates are fixed on a basis estimated to yield a fair return to the roads. Within each district, however, there are strong and weak roads. A schedule of rates which would allow the strong roads to earn only a fair return would put the weak roads into bankruptcy, and one which would allow the weak roads to earn a fair return would bring the earnings of the strong roads to a high point. Since, in many cases, weak and strong roads exist side by side in direct competition, different rate schedules for the two classes of railroads seem out of the question. To meet this situation the Transportation Act provides for a plan of consolidation under which the earning power and financial strength of the various systems would be about equal, thus offering, if it could be carried out on a basis which would not be unfair or unreasonable, the most logical method of equalizing the financial and operating characteristics of both strong and weak roads. It may, however, prove difficult to devise such a system without unfairness to some of the railroads and their stockholders.

Horizontal Rate Changes Criticized

During the period of federal control and since, by order of the Interstate Commerce Commission, horizontal rate changes have taken place by which all rates are raised or lowered to the same relative extent. Since freight rates have but slight influence on the price of articles of relatively high value and, on the other hand, are of major importance in the price of lower-grade, bulky commodities, it is the opinion of railroad executives and of the majority of shippers that freight rate changes should not be made by horizontal increases or decreases but should be made in such a way as to have the most favorable effect both on the volume of traffic and on commodity prices on which the volume of traffic is to some extent dependent. Many freight rates include arbitrary differentials, and it is generally considered important that such differentials should vary in proportion to the changes in the rates to which they are added. Furthermore, industrial conditions vary from time to time both as between industries and between various sections of the country. It appears, therefore, that rate changes should follow a plan which would be fair to all industries and all commodities, and in which the relations and the spread between rates for various articles and classes of commodities would be proportional.

The present rate structure of the country is not on a scientific basis. It is the outgrowth of rates which were put into effect years ago to promote the growth of undeveloped sections of the

country, to equalize the advantages of various sections in the same markets, or to allow the railroads to compete with water transportation, which in many cases has since ceased to be active. Consequently, mileage is not the controlling factor in a large proportion of the freight rates. Furthermore, low commodity rates have been made in many instances in order to attract the movement of bulky commodities of low value, which would not be shipped except under low rates. With the growth of the country and the development of many hitherto undeveloped districts, the basis of rates has remained unchanged to a large extent. Naturally, any attempt to put into effect a more scientific system of rates than now exists will meet with considerable opposition from the communities and sections which are favored by the present rate structure. Nevertheless, it is most important that a rate structure based as far as possible on mileage, but giving other factors due consideration, should be installed throughout the country, in order that industry in all sections may be put on an equitable basis in this regard, and that no one section will have rates that will give it an unfair advantage over other sections. In the many individual rate adjustments which are constantly being made by railroads throughout the country, however, the tendency for some years has been to give the mileage factor greater consideration. It would be necessary, however, to continue to ignore mileage as the controlling factor in rail rates which would be made in competition with water rates, since rates by water are ordinarily less than rail rates between the same points.

Consolidation

The Transportation Act, in permitting consolidations, completely reverses the government's former policy in this regard as embodied in the Sherman Anti-Trust Law. This policy has hitherto prevented many consolidations which otherwise would have been made during recent years. The accomplishment of the purposes of consolidations as permitted in the Transportation Act requires that they should be allowed to follow as far as possible the natural lines which they might have followed had they not been restricted in the past. In making voluntary consolidations, it may not be thought desirable by the strong railroads to include many of the weak roads in the new systems because of their poor financial condition or their poor traffic resources. Several years may be required to work out voluntary consolidations satisfactory in the public interest.

If the railroads are allowed by the Interstate Commerce Commission to make voluntary consolidations, when such consolidations as may be found desirable have been completed, provision may then be made to gather up the loose ends and include in the resultant systems roads which are still independent. The difficulty of including many of the weak roads in the consolidated systems upon terms satisfactory to the managements and stockholders of both the larger systems and the roads to be absorbed is one of the many obstacles to a country-wide consolidation program. Furthermore, there are throughout the country many railroads and branch lines which are no longer profitable to the companies which operate them. With improved highways, the automobile truck and passenger bus are capable of serving adequately the communities on many of these lines. Their continued operation serves no economic purpose, but really constitutes an economic waste.

The plan of consolidation which is advocated by the Interstate Commerce Commission is opposed by many railroad executives, partly on the ground that it would force railroads to make alliances which in many cases would not be conducive to more economical operation and which would deprive many railroads of important connections with which at present they have close traffic relations. Furthermore, many shippers and communities oppose the consolidation plan presented by the Commission for fear that large, unwieldy systems will be built up which, in addition to lessening competition, will give less satisfactory service than the present roads. If the railroads are allowed to consolidate along natural lines, or if the Commission should be given authority to allow consolidations upon application of interested railroads, when they are considered to be in the public interest and not destructive of competition, much of the present opposition on the part of railroad executives, shippers, and the public may disappear.

Standardized Shop Operation

In shop operation and repair work, many railroads have not installed modern machinery and methods. Maintenance and repair costs are higher on such roads than on those on which modern shop methods are employed. It seems essential, in order to provide honest, efficient and economical operation as required by the Transportation Act, that all railroads be equipped as early as it may be practicable with modern machinery and shop methods, and that they adopt the principles of scientific management so far as they can be applied to railroad work. Yet the railroads have been prevented in past years from installing modern machinery to a greater extent than they have done, largely because of their inability to earn a sufficient return to attract the necessary capital.

Motor Truck Competition

The motor truck has made rapid strides during recent years in transportation over reasonably long distances. Since the truck is limited in its load to what would be less than a carload for the railroads, for short hauls it may perform an auxiliary service to the railroads for whom short-haul and less than carload traffic are expensive to handle. The motor truck is, however, becoming a direct competitor for longer distances in some parts of the country. Many railroad executives assert that the motor truck and bus are making serious inroads into the earnings of their railroads. It should not be forgotten that the present system is one under which the railroads pay taxes which in part are devoted to the construction and maintenance of the highways over which the trucks operate, while the trucks contribute nothing to the construction and maintenance of the railroads' rights of way. The railroads, on the other hand, through grants of land by federal and state governments and through their franchises under which they have exercised the right of eminent domain, have obtained from the public concessions which do not admit of accurate valuation. An investigation into this subject to determine whether or not the railroads should justifiably be released from paying road taxes would be of great value in clearing up this moot question. It is generally agreed that motor truck owners, property owners, and all others deriving benefit from the roads should be taxed on an equitable basis. Whatever are the conclusions reached and whatever their effect on the railroads and the motor trucks, the shippers will ultimately use that transportation facility furnishing the best service at the least cost, all things being considered.

Relations with Employees and the Public

Several railroads have already established personnel departments, but progress in this direction has had to be cautious because of the strength of the railroad labor unions and their natural antipathy to anything tending to interfere with their influence and power. Some railroads have successfully organized their employees into independent unions to which only employees of the respective roads can belong and whose spokesmen are in constant touch with the management. Others are working out other means of close working relationship with their employees and all clearly recognize that high morale throughout the entire working force of officials and men in the ranks is necessary for the success of the railroads as an industrial undertaking and as a public utility. This cannot be brought about if the railroads are over-regulated to such an extent as to develop the feeling in the minds of the officials that initiative and incentive are of no avail, for that feeling would soon take hold of the employees, to the detriment of efficient and successful operation.

The railroads of the country as a whole do not adequately put before the public the commodity which they have to sell, i.e., service. Some notable exceptions may be cited, but the railroads have not developed the close contact with the public which other public service organizations, particularly the telephone and electric light companies, have made. This might be overcome if the railroads were to organize a campaign to put their service before the public, and were to take the initiative in finding out what service their patrons want, and in providing that service as fully as is possible and consistent with economical operation. Service bureaus with offices at convenient locations might be established for the hearing and speedy adjustment of complaints. Chambers of Commerce and traffic organizations have been the principal points of contact between the railroads and the shippers, but they have been limited in their scope to the discussion of general problems. Furthermore, many shippers, especially small shippers, do not belong to any of these organizations. Due to the time and labor involved, many petty problems of shippers are never brought to the railroad executives' attention, with the result that railroads are thought to be unreliable and inefficient by many shippers, because certain practices go uncorrected through ignorance of their existence on the part of those railroad officials who have power to remedy them. Nearly all contact between the railroads and the shippers has been actuated by the shippers, either individually or through their associations. The railroads should take the initiative in this respect by affording shippers convenient opportunities to present their problems and by speedy adjustment of them in so far as their correction is in accord with efficient and economical operation. There are, however, some railroads which have established closer and more cordial relations with their shippers by active co-operation with them and adjustment of their problems, but the number of these roads is small. The action of the American Railway Association in establishing Regional Advisory Boards in various sections of the country for the purpose of effecting greater co-operation with the shippers is a constructive step in this direction, the success of which will be noted with interest.

The Institute of Transport's Educational Program

British Society Outlines Courses of Study to Be Required of Applicants for Admission

THE INSTITUTE OF TRANSPORT of Great Britain has lately announced its plan for the instruction and examination of future candidates for membership. As explained in an article by W. H. Fraser, which appeared in the *Railway Age* of March 24, the Institute has four classifications of members, viz., students, graduates, associate members and members. The regulations for examinations include only the grades of graduate and associate member, since students and members are selected by the Council of the Institute from the applicants who possess the necessary qualifications which are, however, not determined by a formal examination conducted by the Institute itself.

The educational plan promulgated by the Institute contemplates a three years' course of training to qualify for an associate membership. It is understood, however, that the examinations are supplementary to the regular requirements for admission which include age limitations and experience in transport work. The new plan will be effective from October 1, 1925.

Purposes of the Plan

The Institute will not itself provide any class-room work in preparation for these examinations. That will be left to the various railway companies which have already provided their employees with such facilities, to the various educational institutions of the realm and to the initiative of the entrants into the examinations. A fee of two guineas (about $10) is charged for the graduate's examination and of three guineas (about $15) for that of associate member.

The purpose of the plan for the examinations, according to Modern Transport (London), is four-fold, viz.:

1. To outline courses of study for those desirous of acquiring positions of greater responsibility in the transportation field.

2. To indicate the lines on which specialized instruction in transportation may be given.

3. To encourage research and widen the field of investigation and its application to transport science.

4. To afford to the individual an opportunity, not previously available, of furnishing evidence of having acquired a knowledge of the principles of transportation and their practical application.

Examinations for Graduates

The Institute of Transport admits to the grade of student persons over 18 years of age who are engaged or plan to engage in transport, subject to election by the Council of the Institute. To be admitted as a student, the applicant must have the equivalent of what compares with a high school education or better. The grade of membership in the Institute next above that of student is that of graduate and under the new plan graduates will be required to pass examinations in the following subjects:

1. General economics, including economic history of Great Britain.

2. Either a modern foreign language or mathematics.

3. The elements of railway, highway or waterway operation.

4. The principles of statistics, with special reference to transportation.

5. Either transportation situation of a foreign country or economic geography.

The Council may excuse an applicant for the degree of graduate from this examination in whole or in part if he can show evidence of having passed a higher grade examination of the same character given by any railway or professional body.

That the knowledge expected of graduates is not superficial but is what would be considered on this continent as equivalent to university standard may be judged from the following syllabus of the subjects in which examinations are to be conducted:

GENERAL ECONOMICS, INCLUDING ECONOMIC HISTORY OF GREAT BRITAIN

1. (a) The main economic features of the eighteenth century.
   (b) The agricultural revolution and the disappearance of the yeoman; the effects upon agriculture of improvements in transport and the opening up of new countries.
   (c) The industrial revolution; causes and consequences of the factory system; factory legislation; origin of poor laws and subsequent developments.
   (d) The combination laws and the growth of trade unions; the co-operative movement.
   (e) The free trade movement and the history of taxation; the history of banking during the nineteenth century; trade fluctuations.
   (f) History of the relations of the state to industry, including health and unemployment insurance, employment exchanges and the Trade Boards Acts.
2. (a) Nature and scope of economic study; meaning of the chief economic terms.
   (b) The present organization of industry and commerce, including the following factors determining the geographic distribution of industry and the size of the business unit; types of industrial and commercial undertakings; growth of industrial combination; financing of industries and commerce; credit and the banking system; organization of foreign trade; money markets; foreign exchanges.
   (c) The exchange of wealth; the problem of prices under competitive and monopolistic conditions; the functions and effects of speculation and insurance.
   (d) Nature of the national income; factors determining the distribution of income between the owners of the different agents in production; causes of variations in wages, profits, interest and rent; taxation in relation to the distribution of income.

[Text Books Suggested.—Industrial and Social History of the Nineteenth Century (Rees), Outline of Industrial History (Cressey), Text Book of Economics (Briggs), Outlines of Political Economy (Ely and Wichers), Economics of Industry (Marshall).]

A MODERN FOREIGN LANGUAGE

1. Translation at sight from the modern foreign language into English.
2. Translation of easy English passages into the modern foreign language, with questions dealing with the grammar of the foreign language.
3. Translation from one or more prescribed books with literary and grammatical questions arising out of them.
4. Short essay in the foreign language.

MATHEMATICS

1. Algebra up to and including the binomial theorem.
2. Plane trigonometry—to solution of triangles (inclusive).
3. Analytical geometry of the straight line and circle.
4. Graphical methods and elementary notions of the calculus.

THE ELEMENTS OF TRAFFIC WORKING BY RAILWAY, ROAD AND WATER (INCLUDING DOCKS)

1. The function of a transport agency and the special characteristics of railways, roads, waterways and docks as such agencies.
2. General principles of staff organization of the above transport agencies.
3. Equipment. The general principles involved in—
   (a) The construction and lay-out of the "specialized road" (railways, waterways and docks).
   (b) The choice of the vehicles or vessels.
   (c) The design of other equipment and accommodation necessary.
4. Passenger Services.—A general review of the services offered by each of the above transport agencies and of the operating methods by means of which these services are rendered.
5. Freight Services.—A similar general review of the services offered by each of the above transport agencies and of the operating methods by means of which these services are rendered.
6. Competition and co-operation between different transport agencies and modes of transport.
7. Interchange of traffic as between transport agencies of the same and of different kinds.
8. The problem of collection and delivery of traffic in the case of each transport agency; the different methods employed.
9. General review of statistics of operation of each of the above transport agencies.
10. General review of (a) the capital cost, (b) the revenue, (c) the

expenditure of a typical railway company, a road transport company, a canal company, a dock and harbor authority.

[Text Books Suggested.—Transportation Rates and Their Regulation (Brown), The Elements of Railway Operating (Hallsworth), Principles of Ocean Transportation (Johnson and Huebner), Motor Road Transport for Commercial Purposes (Phillimore), History of Inland Transport (Pratt), Elements of Railway Operating Economics (Travis, Lamb and Jenkinson).]

PRINCIPLES OF STATISTICS, WITH SPECIAL REFERENCE TO TRANSPORTATION

1. General principles and methods.
(Useful preliminary knowledge.—Use of algebraic formulæ and simple graphs; contracted methods of arithmetic and slide-rules.)
Nature of statistics; counting and analysis of numerical results on a large scale.
The unit or what is counted; exactness of definition—e. g., track-mile, shunting hour, unemployed person, weekly wage.
Collection of data; the machinery by which facts are recorded.
Tabulation and summarization to bring out essential relationships; characteristics of a good table.
Cross tabulation and formulæ to show the relationship of two variables.
Analysis of results; use of percentages, ratios and averages.
Weighted averages and index numbers.
Graphic representation of statistics.
Criticism of statistical results; their uses and limitations.
Application of methods to population, production, trade, prices and wages; sources of information.
2. Application of statistics to railway transport:
(i.) Statistics to indicate development of traffic and receipts, year by year or period by period.
(a) Passengers; number and receipts.
(b) Merchandise: tonnage and receipts.
(c) Parcels and miscellaneous traffic.
(d) Receipts and expenditure, classified.
(e) Ton-miles and passenger-miles.
(ii.) Statistical units as tests of efficiency:
(a) Results per hour or per day in traffic moved (tonnage of goods or number of passengers), or mileage covered.
(b) Loading of passenger trains.
(c) Train loads and car loads of merchandise.
(d) Ton-miles and train-miles per engine or per train hour.
(iii.) Statistical units for costing purposes. Costs per ton or per car of traffic.:
(a) In collection and delivery.
(b) At terminal stations.
(c) In service of conveyance.
(d) In classification yards.
(iv.) Units of general importance:
Train-miles, passenger and freight; ton-miles; passenger-miles; commodity statistics. Application of these generally and locally, per hour, per day, or per month. Variation of figures according to classes of traffic dealt with.
3. Application of statistics to road transport.

[Text Books Suggested.—Manual of Railway Statistics (Boag), Elementary Manual of Statistics (Bowley), Official Statistics, What They Contain and How to Use Them (Bowley); Elements of Statistical Method (King).]

THE TRANSPORT SYSTEMS OF A FOREIGN COUNTRY. SPECIMEN SYLLABUS—FRANCE

1. Railways—
Introduction of railways into France.
Early state enterprise.
Principal legislative enactments: 1842, 1859, 1883, 1921.
The principal systems of railways and their relative geographical and financial positions.
Descriptions of locomotives, passenger cars and freight cars.
General idea of rates and charges systems.
Purchase of Chemin de Fer de l'Ouest by the state and relationship between state and private railways.
The provisions of the Transportation Act of 1921.
2. Roadways.—Their character and extent; responsibility for construction and maintenance; financial responsibilities.
3. Waterways.—Extent; method of charging; relationship to public authorities; facilities provided.
4. Docks and Harbors.—Controlling authorities; nature of special traffic at each; rail and waterway connections; methods of assessing dues and charges.
5. General outline of history of development of railways, roadways and waterways.

ECONOMIC GEOGRAPHY

1. Physical geography of the five continents, with special reference to mountain ranges, river basins, coast lines and climate, including a knowledge of prevailing winds and important ocean currents.
2. The chief sources of the more important raw materials, animal, vegetable and mineral, especially those which form an important part of international trade.
3. The chief manufacturing centres in the more important industries, and the influence of geographical conditions in the location of these centres.
4. A study of traffic routes by land and water, with special reference to the transport of the chief raw materials and manufactured products.
5. A more detailed study of the economic geography of Great Britain and *one* of the following:

(a) France.
(b) Germany.
(c) Italy.
(d) Spain.
(e) Belgium and Holland.
(f) United States of America.
(g) Canada.
(h) Brazil and the Argentine.
(j) India.
(k) China and Japan.
(l) South Africa.
(m) Australia and New Zealand.

[Text Books Suggested.—Commercial Geography (Brigham), Handbook of Physical Geography (Chisholm), Industrial and Commercial Geography (Russell-Smith), Sea Ways of the Empire (Sargent).]

Examinations for Associate Members

Associate members of the Institute will be elected by the Council from applicants who must be at least 25 years of age and who must show a minimum of five years' experience in a transport undertaking. In addition to the other qualifications for associate membership, applicants will be required to pass an examination in their particular branch, i.e. traffic (i.e. operation), engineering, audit or legal. The following outline covers the examinations to be given a candidate for this degree in the traffic (i.e. operation) department of the railway branch of the Institute and is indicative of the thoroughness required:

1. The economics of railway transport.
2. Modern railway operation.
3. The rights and duties of transport undertakings.
4. Operation or economics of some other form of transport (highway or waterway).

As could be expected, the examinations for this grade are much more thorough than for that of graduate. Witness the syllabus for the subjects of railway economics, railway operation and the rights and duties of transport undertakings:

THE ECONOMICS OF RAILWAY TRANSPORT

1. Transportation and the economic development of a country.
2. The present dependence of industry and commerce on further developments in transport by rail.
3. The organization of a railway company.
4. The promotion of a railway in Great Britain and its sanction by Parliament.
5. Capital and expenditure of British railways.
6. Gross and net receipts. Railway dividends in relation to capital and risks involved. Comparison with returns to capital in other enterprises.
7. Analysis of a railway report.
8. The economic functions of a modern railway contrasted with the early views of the function of a railway.
9. General review of the development of rates and fares.
10. The Railway Rates Tribunal and its economic functions.
11. Principles of railway rates and fares.
(a) The principles of differential charging.
(b) Freight classification.
(c) The compilation of class rates.
(d) Exceptional and special rates.
(e) Owners' risk rates.
(f) Fares: Ordinary, season and shippers' tickets, workmen's tickets, tourist and excursion fares.
(g) Freight rates by passenger train.
(h) Private sidings and demurrage—charges and regulations.
12. Historical study of the growth of freight and passenger traffic on British railways.
13. The Railway Clearing House.
14. Railway transport and competition by other means of transport.
15. Railways and the state.
16. State ownership and control as shown in India, South Africa, Germany, France, Italy and the United States.
17. Comparison of British railways with other railways in respect of organization, services and charges.
18. Publicity

[Text Books Suggested.—Elements of Railway Economics (Acworth), State Railway Ownership (Acworth), the Railways and the Traders (Acworth), Transportation Rates and Their Regulation (Brown), Railway Rates and Traffic (Colson), Railroads—Rates and Regulation (Ripley), Economics of Railway Construction (Webb).]

MODERN RAILWAY OPERATION

1. The function of railway operation.
2. The different departments of a modern railway company; the relationship of these departments to one another; and the organization of a railway company's staff.
3. Passenger services.
(a) The design and layout of a passenger station with consideration of the work to be performed.
(b) The equipment of different kinds of stations.
(c) The operating time-table and its preparation.
(d) Control of passenger cars; the passenger car roster.
(e) The work of the station-master and his staff.
(f) Passenger locomotives in relation to passenger train operation.
(g) The operation of heavy holiday traffic.
(h) The operation of heavy suburban traffic.
(i) The principles of signal operation.
(j) Automatic train control and automatic signaling in their relation to railway operation.
(k) The autocar train and its possibilities.
(l) Passenger train services in relation to various public needs.
(m) Special points in relation to passenger train services, e. g., margins, running times on different gradients, slip coaches, reservation of seats, etc.
(n) The problems of ticket inspection and collection.
(o) The methods of dealing with passenger luggage.
(p) Parcels and other traffic by passenger train.
4. Freight train services.
(a) The freight station—layout, equipment and staff in relation to work to be done.

(b) Different methods of operation and their relative efficiency.
(c) The loading of cars; types of cars.
(d) The transhipping station and its work.
(e) The layout and work of a classification yard.
(f) The problems of switching.
(g) The different classes of trains—the pick-up train, the fast light freight train and the slower heavy train.
(h) Power in relation to freight train service and switching.
(i) The control and distribution of cars.
(j) The operating time-table in relation to freight and mineral traffic.
(k) Central train control.
(l) Freight train operation and the train crew's shift of duty.
(m) The trainman's journal and the engineman's ticket.
(n) Freight traffic to and from ports.

5. Mineral train operation.
(a) Coal from mines to ports of shipping.
(b) Distribution of coal for locomotive fuel.
(c) The control of empty coal cars.
6. The problems of unbalanced train operation.
7. The special problems of underground railways.
8. The advantages and disadvantages of the electric locomotive. The problem of electric railways.
9. The problem of safety in railway operation.
10. The question of efficiency; operating statistics.
11. The training of the railway operating staff.

[Text Books Suggested.—Transportation Rates and Their Regulation (Brown), The Principal Factors in Freight Train Operating (Burtt), Railway Organization and Working (Dewsnup), The Elements of Railway Operating (Hallsworth), Elements of Railway Operating Economics (Travis, Lamb and Jenkinson).]

THE RIGHTS AND DUTIES OF TRANSPORT UNDERTAKINGS

1. Classification of statutory and non-statutory undertakings.
(a) Statutory undertakings:
(i.) General methods of procedure and principles governing the grant of statutory powers by legislative action and provisional orders.
(ii.) General provision of railway, light railway, tramway, dock, harbor and inland waterways acts, with reference to:
(a) Control and management.
(b) Services to be rendered.
(c) Power to try tolls.
(d) Power to make by-laws.
(iii.) General provisions of law for public protection with reference to:
(a) System of tolls and charges.
(b) Equality of treatment.
(c) Adequacy of services at ordinary and other rates.
(d) Public safety.
(e) The rights and duties of a common carrier.
(iv.) Tribunals.—The functions of the Railway and Canal Commissioners, Railway Rates Tribunal, Ministry of Transport, Board of Trade, etc., in relation to transport undertakings.
(b) Non-statutory undertakings.
(i.) Transport by Road.—The Hackney Carriage and other acts affecting transport by road; licensing and supervision; prescription of routes; ordinary and extraordinary traffic; contributions to road maintenance by rates and special taxes; rights and duties of a common carrier.
(ii.) Transport by Air.—International convention and general regulations by government departments for aerial transport.

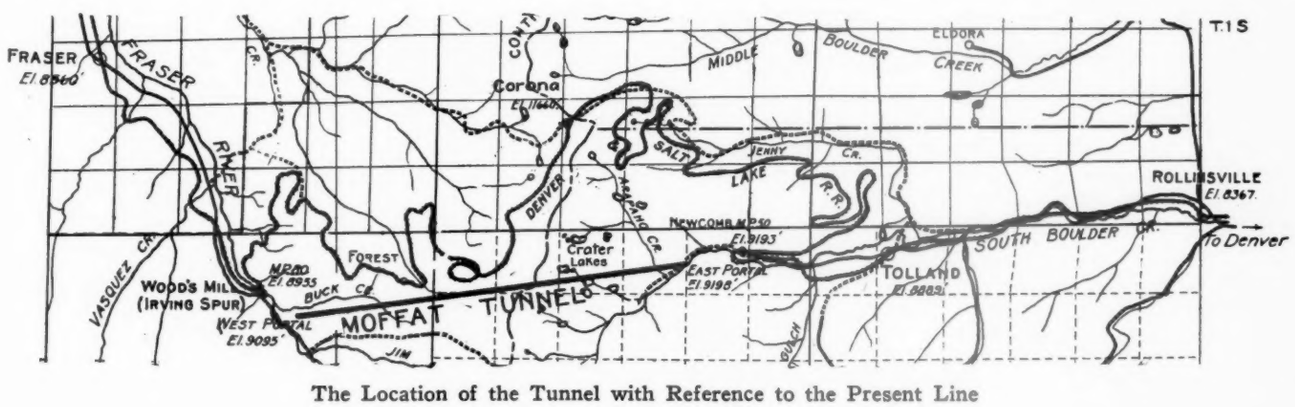
2. International transport undertakings:
International undertakings and obligations between transport undertakings under Art. 23 (e) of the League of Nations, as developed under the Barcelona convention.

[Text Books Suggested.—Leslie on Railways: The Railway Rates Tribunal, Its Jurisdiction and Practice (Jones); Law Relating to Road, River and Air Traffic in London and Elsewhere (Romer); Reports of Barcelona and Other Conferences (League of Nations).]

Moffat Tunnel Project Nears Realization

Bids Being Received for Construction of Six-Mile Bore, Lowering Summit Elevation Half Mile

AFTER MANY ATTEMPTS to finance the driving of a tunnel through the continental divide on the line of the Denver & Salt Lake in Colorado during the last 20 years and thereby lower the summit of this line by a half mile, this project now appears possible of realization. In fact, plans have progressed to the point where the Moffat Tunnel Commission, a creation of the state of Colorado, has invited bids for the construction of this tunnel and all indications point to the early undertaking of actual construction on the project.



The Location of the Tunnel with Reference to the Present Line

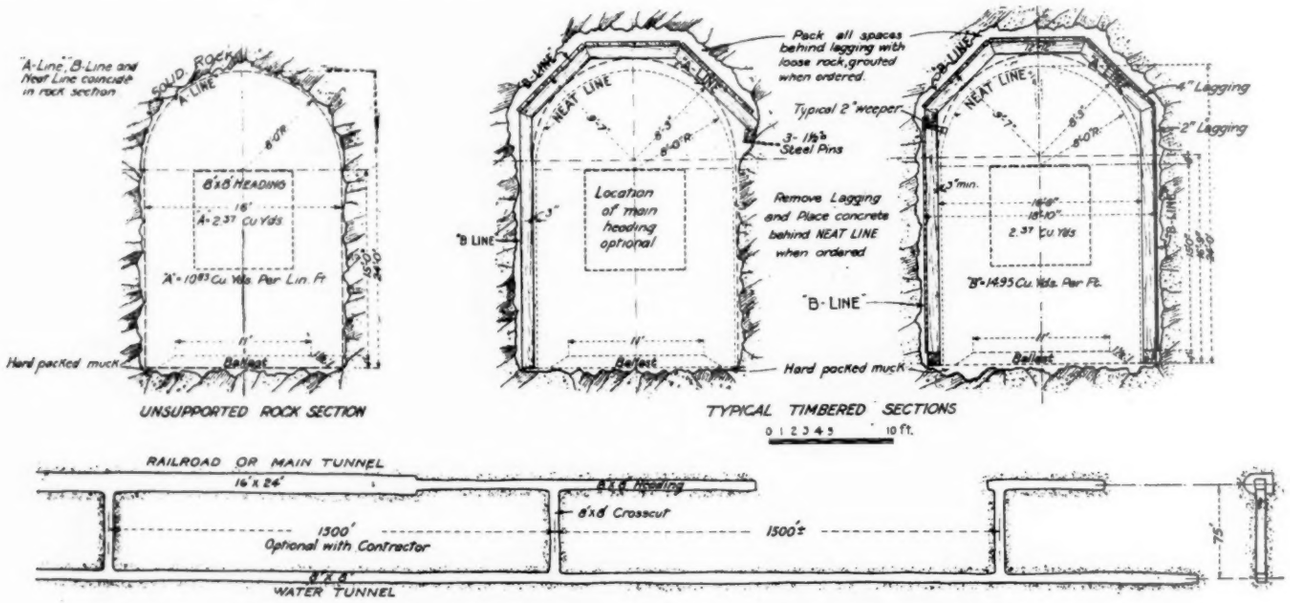
The crossing of the continental divide has been an insuperable obstacle in the way of the successful operation of the Denver & Salt Lake since the completion of the first section of the line in 1905. Starting at an elevation of slightly over 5,000 ft. at Denver, this line climbs with an almost continuous grade to a summit of 11,660 ft. at Corona, 65 miles west of Denver from which point it descends on an almost continuous grade for nearly 90 miles to Orestod at an elevation of 6,700 ft. The maximum grade on each slope is two per cent except for 27.63 miles of four per cent grade between East Junction on the eastern slope and Vasquez on the west. This four-per cent line over the summit was built as a temporary expedient in order not to delay operation, pending the driving of a six-mile tunnel through the divide. Since this line has been built it has never been possible to finance the construction of the tunnel, and the four-per cent line over the summit has remained in service until the present time. In addition to the adverse grade the curvature is also excessive, the maximum curvature of 12 deg. for the remainder of the line being increased to 16 deg. over this section. In this distance of 27.63 miles, 78 per cent of the line is on curves and 31 per cent of this distance is on curves of 16 deg.

Following the failure of the original promoters of the

Denver & Salt Lake to finance this tunnel, the city of Denver voted $3,000,000 in bonds in 1913 to pay two-thirds of its cost in order to afford an outlet for a large undeveloped area in the northwestern part of Colorado. However, this bond issue was declared unconstitutional and in 1920 another plan was devised whereby the state was to provide funds for the construction of this tunnel and also for two tunnels through the continental divide on the routes of the Denver & Rio Grande. Nothing came of this scheme and the project lay dormant until May, 1922, when a law was passed providing for the creation of an improvement district comprising the area tributary to the Denver & Salt Lake line, which would be benefited by the completion of the tunnel, and with authority to levy assessments against property in this district as security for the construction bonds to be issued.

Under this law a tunnel commission was created. It is this commission which is now asking for bids for the construction of this tunnel.

The tunnel will be 31,875 ft. or 6.04 miles long; it will be 16 ft. wide and 24 ft. high, and will be built from an 8-ft. by 8-ft. water tunnel which will serve as a pioneer tunnel for



Sketch Showing Relative Positions of Railroad and Water Tunnels and Typical Sections of Railroad Tunnel

construction purposes from which cross entries will be driven to the main tunnel at intervals of approximately 1,500 ft. The east portal of the tunnel will be located three miles west of Tolland, Colo., approximately 50 miles from Denver, at an elevation of 9,198 ft. The grade of the tunnel will ascend from the east portal at the rate of 0.3 per cent to a summit elevation of 9,239 ft., 14,708 ft. in from the east portal. From this point the grade will descend at the rate of 0.8 per cent to an elevation of 9,095 ft. at the west portal. It is expected that the construction will require three years and an expenditure of $6,720,000.

The tunnel will replace 32 miles of the present line and effect a net reduction in distance of 23 miles. It will eliminate all but two curves of over 12 deg. and all of the four per cent grade besides lowering the summit 2,432 ft. It will also eliminate all of the snowsheds and the severe winter trouble.

This work is being carried on under the direction of R. H. Keays, chief engineer of the Moffat Tunnel Commission, assisted by a board of consulting engineers, including D. W. Brunton, L. B. Blauvelt, J. Vipond Davies, and J. Waldo Smith.

Tool Foremen's Convention

THE American Railway Tool Foremen's Association held its eleventh annual convention at the Hotel Sherman, Chicago, on August 29, 30 and 31. About 80 members and guests were present at the opening session which was presided over by J. B. Hasty (A., T. & S. F.), president. After the usual opening exercises, President Hasty delivered his address, pointing out the value of improved methods of handling tool room work and stating that the only way this work can be raised to the desired standard will be by the mutual exchange of experience of the members of the association. The possible economy from standardizing tools used in railroad shops is well known and this work can be best carried out through the Tool Foremen's Association. A great deal has already been accomplished along this line but standardization of shop tools should be carried much further. Tool foremen can also be of great value to the railroads employing them by studying and developing tools which will increase the efficiency of machine operations. In view of the high cost of labor, at the present time, more production per man is needed in order to keep costs within reason in all industries including the railroad industry. The production of machine operators is so largely dependent upon the kind and condition of the cutting tools, jigs and fixtures that these accessories deserve the closest study of expert tool makers. The value of the competent tool foreman in speeding up production by this means can hardly be overestimated.

Following Mr. Hasty, Past President J. J. Sheehan (N. & W.), was called on for some remarks, which he made as follows: "One man can not see all the angles to a problem and it is, therefore, a good idea for tool foremen to come together and exchange experiences to their mutual advantage and for the benefit of the railroads which they represent. Tool foremen have had strenuous times during the last few years on account of the war and unsettled labor conditions, the effects of these conditions being felt almost as much by the tool foremen as by other shop supervisors. . . ."

Following the opening addresses the association listened to two papers on forming and combination punches and dies by Henry Otto (A., T. & S. F.), and J. E. Foley (B. & H.). Further details regarding the convention will be published in next week's issue

Report on Sprague Automatic Train Control

Detailed Review of Sixty-Day Test—Results Not Conclusive But Further Experiments Encouraged

THE Interstate Commerce Commission has issued a report, dated August 2 and signed by W. H. Harland, chief of signals and train control in the Bureau of Safety, on the tests, made by the Bureau, of the automatic train control system of the Sprague Safety Control and Signal Corporation, of New York City, between May 1, 1922 and January 31, 1923. This investigation was made jointly with representatives of the American Railway Association, and the tests took place on the New York Central between Ossining, N. Y. and Tarrytown. One locomotive, No. 3345, was used, with one car, making trips over a section of the main line (one track) about five miles long, with six indication points. This section of track was assigned exclusively for the test operations seven hours a day; but the electric propulsion current was not cut off.

The Sprague system is of the intermittent magnetic induction type, permanent magnets fixed to the ties between the rails of the track being used to cause the application of brakes, and electro magnets to neutralize the permanent magnet when brake application is not desired. An illustrated description was published in the *Railway Age* of April 22, 1922. The receiving apparatus, for controlling the air brake mechanism on the locomotive, is suspended from the tender on adjustable supports, leaving a space of about 8 in. between it and the track magnets. The circuit breaker in this receiver controls three relays mounted in a box on the locomotive running board. The relays control air valves fixed beneath the cab, at the left side, which in turn control the brake-setting valve. The speed-control mechanism, a centrifugal governor, is attached to one end of the front truck axle, and is connected to the other apparatus by a flexible hose and a flexible electric cable. Signal lights are fixed inside the cab on both sides. In an approach section a train encounters two brake-application magnets (in locations corresponding to caution and stop) and a reset magnet near the end of the section. If the application magnets act the reset magnet is inert.

Experiments Begun in 1907

Frank J. Sprague, inventor of this system, began his experiments in 1907, brought them to the attention of the Interstate Commerce Commission in 1913 and gave the commission a description in 1915. The New York Central experiments were planned for in May, 1921, and extensive tests were made before the commission began its investigation; and after the investigation was begun (May 1), tests were carried on until November 20, 1922, before the inspectors began the service tests which are now made the subject of the report.

These final tests included 145 trips and 725 tests. In recording the performance of the device, the movement of the locomotive over each track-magnet was counted as an operation. The report shows: Proper operations at track magnets, 2174; safe failures at track magnets, 1; false clear operation at track magnets, 1; unsatisfactory operation at track magnets, 1.

The report fills 16 pages (about 8,000 words) but has no illustrations or drawings. The parts of the apparatus are explained in detail and three pages are devoted to a description of their operation; then follows an analysis of the tests, with special explanation of the failures and unsatisfactory operations. Continuing, it discusses the apparatus and its behavior as follows:

Discussion

The Sprague device is designed upon the closed-circuit principle. . . . It should be noted in stating that this device is designed upon the closed-circuit principle; that it is assumed the permanent magnets are of such a nature that their integrity to function as intended can be relied upon under conditions of reasonable inspection and maintenance for a considerable period of time. The locomotive receiver application armature contact is based on the open-circuit principle; its contact is normally closed and depends upon energy to actuate the armature so as to operate its contact. This condition is somewhat analogous to the mechanical trip.

The above explanation would appear to justify the statement that the locomotive receiver is practically designed, as stated, on the closed-circuit principle.

During the inspection and checking of the locomotive circuits it was noted that a high resistance ground existed on certain wires when the headlight generator, which is part of the standard locomotive equipment, and which was utilized by the proprietor for the purpose of charging his 12-volt storage battery, was connected through the charging panel. Further investigation indicated that a high resistance ground existed on both generator leads, one being of higher value than the other.

It is known and agreed to that a ground on certain portions of the reset circuit will cause the reset relay to become energized, the cause of which was traced to the headlight generator.

It was noted that while making terminal tests in Harmon yards that the reset collector plates were at times affected by stray fields so that when the locomotive was in caution condition and the reset button was closed the receiver reset armature would be attracted so as to close its contact and energize the reset relay. Investigation failed to reveal any apparent cause for such action, other than the fact that electric motors were moving on near-by tracks. . . . During the conduct of the tests it has been demonstrated that under certain traffic conditions affecting the flow of propulsion current from or to the substations and power houses intermittent stray fields were encountered that affected the locomotive receiver in a perfectly logical manner, but certainly not as intended or desired. It has been noted that the application armature was affected at certain cross-over switches at certain times, so as to cause an undesired brake application. The reset armature has been affected at cross bonding and third-rail feeder cables, both of which cross the tracks at right angles thereto, so as to energize the reset relay as the locomotive passed over such locations while in caution condition.

It is probable that all such erratic and undesirable operations could be practically, if not completely, overcome by the installation of suitable means of protection.

In accordance with the above statement, one end of the cross-over switch was equipped with a cable to carry a portion of the return propulsion current in a direction opposite to the normal flow of this current to the substation or power house; . . . but on two occasions a brake application was received in the vicinity of the protected portion of this switch due to an error made in the length of the protection cable.

The proprietor stated that in order to receive the fullest measure of protection it would be necessary to insert certain insulated rail joints, which was not done in this case.

One method of protection against stray reset fields at cross

bonding, feeder cables, etc., was proposed in the form of a metallic screen over such cables. The installation of a normally open switch (engineman's reset button), inserted in the reset circuit in such a manner as to require the co-operation of the engineman when a reset was desired while passing over such a magnet, was thought by the proprietor to be sufficient protection against such undesirable reset fields and was in use during the official tests.

The weather conditions during the period of official tests, from December 5 to January 31, were rather severe for this section of the country. The track magnets were buried in snow and ice for weeks at a time. It was noted that this condition had no effect on their proper function.

The analysis of the performance of the track magnets indicates that the electromagnets used for the reset function can be relied upon at all times to provide maximum protection. The characteristics of such magnets are well known and established and being installed entirely on the normal danger system, the absence of function as intended will result on the side of safety.

In regard to the permanent magnets, particularly in reference to the service and conditions existing in these tests, their characteristics have not yet been as firmly established as those of the electromagnets. The permanent magnets do not have the inherent principle to provide maximum protection in case of loss of function. It is believed, however, that the loss of function is so remote that the use of such magnets is practicable and can be relied upon for the purpose intended.

The device tested demonstrated that this apparatus can be installed and interconnected with existing signal systems, regardless of whether the signal control circuits are alternating current or direct current, normal clear or normal stop, and also whether the track circuits are alternating current or direct current.

The application of this device to the varying needs and conditions of every-day freight service was not demonstrated. We are unable to express any opinion other than our confidence in the ability of the proprietor to arrange the device so that it will function in accordance with the requirements of such service.

The locomotive was not operated in territory other than where the tracks are used for the return of propulsion current, at least not sufficiently to demonstrate whether or not the device would be affected by conditions existing outside of third-rail territory.

It is reasonable to assume that with track magnets of greater magnetic strength the adjustment of the receiver may be such as to overcome a considerable amount of interference from stray fields.

The performance of the locomotive apparatus to function as designed and installed was satisfactory and demonstrated that a predetermined brake application can be initiated through the medium of a magnetic impulse emanating from track magnets and controlled in a practicable manner.

The speed governor is a mechanical device used to open and close the speed-control circuits. This apparatus is well constructed. An inspection at the close of official tests failed to reveal any apparent sign of weakness of parts or of lost motion between moving parts. It is our opinion that this speed governor is an efficient device and can be depended upon to function as intended with reasonable inspection and maintenance.

The relay assembly is well designed and constructed. No trouble was experienced with this apparatus, and it is believed to be an efficient device for the purpose intended.

The pilot valve magnets are of the form wound type and have no unusual features different from similar types used extensively in signal practice. These magnets appear to be well adapted for the purpose intended.

The visible cab indicators consist of ordinary lamp bulbs and sockets. Colored roundels were used to differentiate between indications and were efficient for this purpose.

Attention is again called to the necessity of proper adjustment of the receiver armature contacts, the operation of these contacts being of vital importance. A weak adjustment may result in unnecessary brake applications on account of vibration and perhaps stray fields of weaker strength; while a stiff adjustment of the application armature may result in its contact not being properly opened when passing over an active application magnet especially at high speed. A proper adjustment of the receiver contacts is therefore imperative.

The operation of the receiver under the influence of stray fields is quite logical unless some means of differentiating between the flux of the permanent magnets and that of the stray fields can be devised. This appears impossible and the trouble or fault appears to reside apart from the receiver, which can hardly be criticized for its operation under such conditions. The remedy should be applied at the source, *i.e.*, the track.

The receiver is well designed and constructed, and during all of our tests and observations it was immune from dirt and moisture.

The pneumatic apparatus interferes in no way with the manual operation of the engineman's brake valve, and the use of this device will have no bad effect upon the standard air-brake equipment.

The principles of design and construction of the air valves are based upon well known and approved standard air-brake apparatus.

In connection with the false clear failure in test 924, the proprietor has recently raised the question of the varying weight of coal and water, which may affect the height of the tender above the top of the rails, and in so doing alter the height of the receiver. The supporting brackets of the receiver housing are mounted upon the under portion of the tender frame. The latest explanation offered by the proprietor in regard to this failure is that there were a number of contributory factors: First, the improper assembly of the magnet bars in this particular track magnet; second, the distortion of the rear end of the left-hand flux collector plate; third, the height of the receiver may have been increased by a low supply of coal and water. . . . In our opinion it is quite necessary in the installation of such a device that proper allowance be made for the widest variation that may be encountered in every day service. Furthermore, the operating margin of the track magnets must be great enough to insure a free field of sufficient strength to operate the receiver armature under any condition of distortion that may occur to the flux-collector plates in ordinary service.

Conclusions.—While, as a whole, the observations and service tests made are not considered conclusive, it has been demonstrated that a magnetic impulse can be transmitted in electrified territory from permanent track magnets to the locomotive regardless of speed, oscillation, or weather conditions, and that such impulse will actuate the locomotive apparatus to provide automatic brake application in a practical manner. In view of the results obtained under the conditions surrounding these tests, the conclusion is warranted that this device has such inherent merit that a more extensive installation should be made where the real value of this system can be more fully demonstrated.

SPOKANE ASSISTS.—To aid the Northern Pacific, the Great Northern and the Chicago, Burlington & Quincy in the campaign to advertise the Northwest, the Spokane Publicity-Tourists Bureau has appointed committees to assemble data to be used by the railroads in publications. Committees have been appointed on water power and mining, and a special committee has been appointed to make a survey of places throughout the United States where supplies of Spokane literature should be kept.

Freight Car Loading

WASHINGTON, D. C.

LOADING OF REVENUE FREIGHT continues to show record-breaking figures. From January 1 this year until August 18, inclusive, (a period of 33 weeks) 30,999,244 cars were loaded with revenue freight. This is the largest number loaded during any corresponding period, exceeding by 5,195,251 cars the loading with corresponding period last year, and by 6,904,844 cars the corresponding period in 1921.

For the week ended on August 18, 1,035,741 cars were loaded, the second highest total for any one week ever recorded. This was only 5,303 cars under the loading for the record week of July 28, when 1,041,044 cars were loaded.

Compared with the corresponding week of last year, this was an increase of 189,475 cars or 22.4 per cent, while it also was an increase of 220,594 cars as compared with the corresponding week in 1921. In the Eastern district, the number of freight cars loaded increased 26.3 per cent over the number for the same week last year, when, however, the strikes of both miners and railway shopmen were in progress. Loading in the Southern district increased 22 per cent, while in the Western district the increase was 17.7 per cent.

The total for the week of August 18, also, was an increase of 62,579 cars over the preceding week, when freight loading was reduced due to the observance of a day of mourning for President Harding.

Loading of merchandise and miscellaneous freight, totaled 589,352 cars. This was not only an increase of 38,606 cars over the preceding week, but an increase of 42,873 cars over the corresponding week last year, and an increase of 96,603 cars over the corresponding week two years ago.

Loading of grain and grain products totaled 52,521 cars, 6,372 cars above the previous week. This was, however, a decrease of 2,983 cars under the corresponding week last year, and a decrease of 7,545 cars under the corresponding week in 1921.

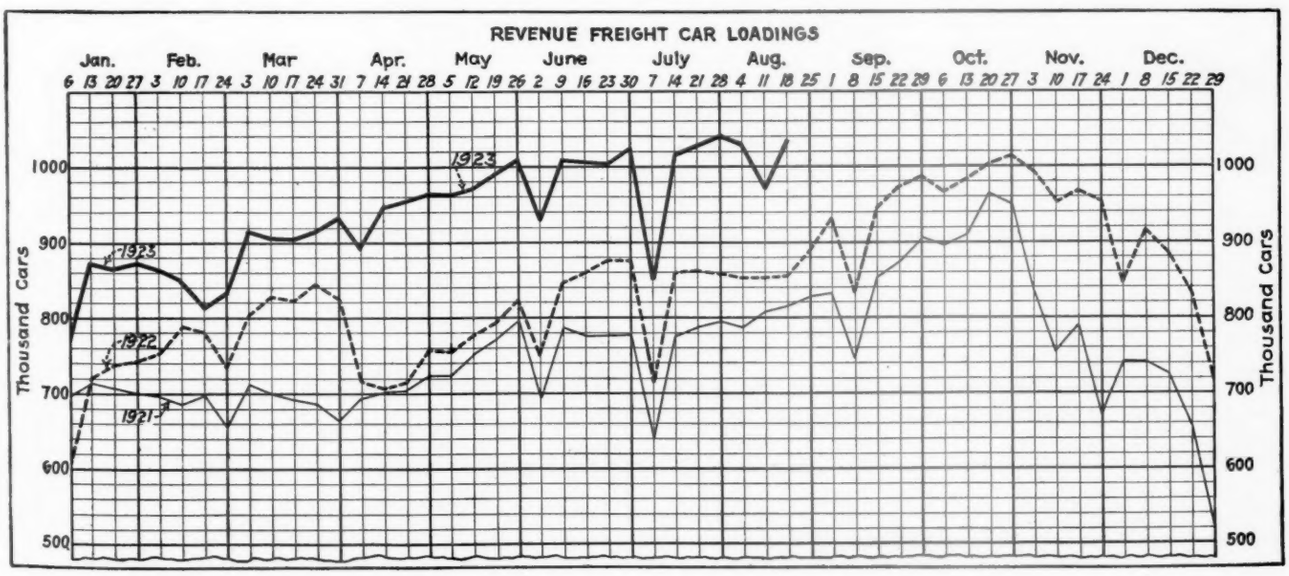
Compared by districts, increases over the week before in the total loading of all commodities were reported in all

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, AUGUST 18, 1923

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L. C. L.	Miscellaneous	Total revenue freight loaded	Corresponding period	
										1923	1922	1921
Eastern	1923	10,105	3,055	52,484	3,667	6,310	8,832	66,257	97,771	248,481	.....	.....
	1922	10,332	2,802	8,960	1,272	5,601	6,941	65,038	95,832	.....	196,778	198,559
Allegheny	1923	3,901	2,830	55,572	6,732	3,960	14,425	48,866	83,652	219,938	.....	.....
	1922	3,932	3,175	21,805	4,301	3,031	12,548	49,902	78,722	.....	177,416	159,021
Pocahontas	1923	361	221	28,278	576	1,801	210	6,548	4,439	42,434	.....	.....
	1922	196	254	21,330	266	1,172	26	4,395	2,560	.....	30,199	28,599
Southern	1923	4,345	2,067	23,604	1,043	23,836	1,654	37,955	36,888	131,392	.....	.....
	1922	3,729	2,178	15,296	776	17,677	1,038	34,355	32,617	.....	107,666	108,763
Northwestern	1923	14,615	7,794	10,013	1,067	19,990	52,499	30,950	39,639	175,967	.....	.....
	1922	15,146	6,809	4,796	1,023	15,276	44,097	29,201	33,726	.....	150,074	127,585
Central Western	1923	14,634	13,392	14,490	363	12,220	2,798	35,673	57,183	150,753	.....	.....
	1922	17,013	11,780	6,444	404	8,313	2,427	33,296	53,674	.....	133,351	129,067
Southwestern	1923	5,160	3,791	4,632	139	9,182	341	14,989	28,542	66,776	.....	.....
	1922	5,156	2,676	2,820	140	6,371	458	13,000	20,161	.....	50,782	63,553
Total, West. dists	1923	33,809	24,977	29,135	1,569	41,392	55,638	81,612	125,364	393,496	.....	.....
	1922	37,315	21,265	14,060	1,567	29,960	46,982	75,497	107,561	.....	334,207	320,205
Total, all roads	1923	52,521	33,150	180,073	13,587	77,299	80,759	241,238	348,114	1,035,741	.....	.....
	1922	55,504	29,674	81,451	8,182	57,441	67,535	229,187	317,292	.....	846,266	.....
	1921	60,066	28,499	152,513	4,524	44,809	31,987	220,956	271,793	.....	.....	815,147
Increase compared	1922	.....	3,476	107,622	5,405	19,858	13,224	12,051	30,822	189,475	.....	.....
Decrease compared	1922	2,983	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1921	.....	4,651	36,560	9,063	32,490	48,772	20,282	76,321	220,594	.....	.....
Decrease compared	1921	7,545	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aug. 18	1923	52,521	33,150	189,073	13,587	77,299	80,759	241,238	348,114	1,035,741	846,266	815,147
Aug. 11	1923	46,149	30,807	177,259	12,934	73,438	81,829	227,685	323,061	973,162	842,690	808,269
Aug. 4	1923	52,871	31,480	190,531	13,458	76,095	83,507	240,465	344,723	1,033,130	842,663	786,178
July 28	1923	53,160	31,849	194,546	14,274	77,799	83,633	240,046	345,737	1,041,044	848,858	795,432
July 21	1923	46,275	32,454	190,788	14,888	75,808	84,307	240,182	344,225	1,028,927	845,548	788,034

Compiled by the Car Service Division, American Railway Association.



except the Pocahontas district, which showed a small decrease. All districts, however, reported increases over not only the corresponding week last year but over the corresponding week two years ago.

Loading of revenue freight this year as compared with the figures for the two previous years has been as follows:

	1923	1922	1921
4 weeks of January	3,380,296	2,785,119	2,823,759
4 weeks of February	3,366,965	3,207,886	2,739,234
5 weeks of March	4,583,162	4,088,132	3,452,941
4 weeks of April	3,763,963	2,863,416	2,822,713
4 weeks of May	4,873,427	3,841,683	3,733,137
5 weeks of June	4,045,012	3,414,031	3,114,137
4 weeks of July	3,944,386	3,252,107	2,998,885
Week ended August 4	1,033,130	842,663	786,178
Week ended August 11	973,162	842,690	808,269
Week ended August 18	1,035,741	846,266	815,147
Total for year to date	30,999,244	25,803,993	24,094,400

The freight car surplus showed an increase of approximately 4,000 during the week ended August 14, to 78,404, including 56,948 box cars and 6,293 coal cars. At the same time there was a reduction of 1,834 in the reported shortage of 8,315 cars, which included 2,329 box cars and 4,193 coal cars.

Big Four Tests Train Control in Passenger Service

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS made a test of the train control equipment of the Indiana Equipment Company, Indianapolis, Ind., on regular passenger train equipment at Indianapolis on August 25. The purpose of this test was to determine the practicability of restricting the speed of a train automatically in caution territory below a predetermined rate and to make stops within the limits of safety. The speed in the caution block was limited in this case to 35 m.p.h.

The Pacific type locomotive No. 6417, weighed 147,500 lb. on drivers with a total weight of 236,000 lb.; the weight of

The Train Used for the Tests

the tender was 162,000 lb. The cylinders were 22 in. by 26 in. and the boiler pressure 200 lb. This locomotive was provided with complete train control equipment consisting of shoe, speed controller, control board, automatic valve and continuous cab signals as described on page 103 of the *Railway Age* of July 21.

The train consisted of four steel passenger coaches, one business car and one special test car, with a total weight of 637 tons. The air brake equipment of the cars is the Westinghouse P. C.

On leaving a terminal the equipment as installed has a caution condition set up. Therefore on the beginning of the test the train proceeded out of the Indianapolis station under a speed control restriction of 35 m.p.h. At the first signal a clear indication was received after which the train proceeded at a speed of 53 m.p.h. through two blocks. At signal No. 92 the train received a caution indication which caused a reduction of air pressure from 110 lb. to 95 lb., resulting in the speed being reduced from 53 m.p.h. to 35 m.p.h. within 2,210 ft. in 31 sec. The train continued through the block under a speed control restriction of between 35 and 39 m.p.h., and at signal No. 72 which was at stop a stop indication was received, causing a reduction of 35 lb. from the normal 110 lb. brake pipe pressure and resulting in stopping the train in 1,820 ft. during a period of 30 sec.

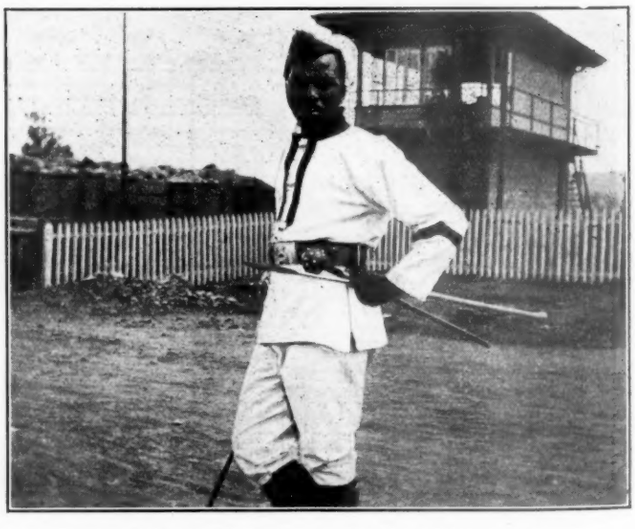
In test No. 2 the train proceeded at approximately 75 m.p.h. through three blocks and received the stop indication at signal No. 72. The engineman took no action to stop the train, thus simulating the condition of a dead man at the throttle, and the engine worked steam until the stop was made. Under this condition the train line pressure was reduced 20 lb. in 20 sec. and the train was stopped in 6,630 ft. in 1 min. 31 sec. In this case the engine brakes were not applied.

In test No. 3, the conditions were the same as for test No. 2 with a speed of 68 m.p.h. excepting that the throttle was eased off and the engine brakes were applied automatically with the train brakes. In this test a reduction of 27 lb. was made in 12 sec. the train being stopped in 4,030 ft. in 1 min. 4 sec.

In test No. 4, the train proceeded at a speed of 53 m.p.h. to signal No. 112 where a caution indication was received and acknowledged by the engineman, when a reduction of 25 lb. reduced the speed to 32 m.p.h. When a speed of 42 m.p.h. was reached an automatic reduction of 8 lb. reduced the speed to 35 m.p.h.

After passing signal No. 102 at proceed, signal No. 72 was encountered at caution while traveling 53 m.p.h. As this caution indication was not acknowledged by the engineman, a reduction of 25 lb. in the brake line caused a train stop within 3,640 ft. in 1 min. 12 sec. The engine brakes were cut in and applied automatically in this test.

MEMBERS OF THE STATE REGULATORY bodies of Iowa, Idaho, North Dakota, Minnesota, Washington and Montana met at Helena, Mont., on August 22 to formulate plans to oppose any efforts which may be made by the Great Northern to obtain an increase in the valuation tentatively made by the Interstate Commerce Commission.



Native Railway Policeman, South African Railways

General News Department

Daniel Willard, president of the Baltimore & Ohio, called on President Coolidge at the White House last Monday.

Fire destroyed the Grand Trunk freight house at Grand Rapids, Mich., on August 27; damage estimated at $200,000.

South Carolina is the latest state to have a regulation for the passage of automobiles over railroad tracks. It is in the shape of an order from the State Railroad Commission; it requires all drivers of motor vehicles for hire to come to a full stop. It does not apply to privately owned automobiles, not used for hire.

Among the seizures of illegal liquor reported in Philadelphia last week were nine carloads of beer, seven of which were found in the North Philadelphia yard of the Pennsylvania Railroad. The yardmaster saw liquid leaking from a car labeled "bananas" and called the circumstance to the attention of Mr. Sams, prohibition enforcement agent.

The American Railway Express Company announces at New York that an experimental express service by aeroplane is to be tried between New York and Atlantic City. Hydroplanes will be used, and the New York landing is to be at 31st street and East River. The southbound trip, as proposed, will start at 5 p. m. and the time to Atlantic City will be about one hour.

Maintenance of way employees on the Pacific system of the Southern Pacific have been granted wage increases, effective on June 1, ranging from one cent an hour to $5 a month. Train dispatchers on the Chicago, Great Western have filed a petition with the Railroad Labor Board requesting the establishment of rates of $335 a month for assistant chief dispatchers and $300 a month for trick dispatchers.

Fly screens are to be fitted in the windows and doors of all passenger coaches of the Louisville & Nashville running in Alabama. This announcement was recently given out at Montgomery. The Legislature of Alabama adopted a law, several years ago, requiring such screens; but there has been controversy as to the reasonableness of the law and also on the ground that the state has not the power to regulate this feature in connection with cars used in interstate business.

Construction of a spur 4½ miles long from the Matanuska branch of the Alaska Railroad to the Moose Creek coal mines in the Matanuska coal field of Alaska is to be completed within the next month. Information received at the Department of the Interior announces that the grading of the roadbed has been finished and that the laying of the steel rails has been started. The building of the spur was authorized by the Secretary of the Interior the latter part of May.

Transportation of mail between New York and San Francisco by aeroplane, making continuous relay trips night and day, was successfully carried out last week in the five-day experiment as planned by the Post Office Department; and officers of the department say the results of the trial trips are sufficiently satisfactory to warrant the establishment of a regular service. The best time, through, was about 26 hours. The fliers started from either coast in the forenoon and the night flying was between Chicago and Cheyenne.

Santa Fe Contemplates Electrification

A survey of the hydro-electric possibilities of the Colorado river has been completed by the Atchison, Topeka & Santa Fe with a view to possible electrification of its transcontinental lines in the desert, according to a statement made by W. B. Storey, president of the system, before members of the Chamber of Commerce of Pasadena, Cal. No definite plans have been made.

General Strike on Canadian Railways Urged

The Central Labor Council of Canada has sent communications to organized and unorganized railroad employees of western Canada urging a general tieup of the Canadian railroad lines during the height of the western grain rush as a means of forcing the Railway Association of Canada to accede to the demands of the railroad workers for increased wages and other conditions.

September Meeting of Central Railway Club

The Central Railway Club will hold its next meeting at the Hotel Statler, Buffalo, N. Y., on Thursday, September 13, at 8 p. m., daylight saving time. The evening will be spent socially with motion pictures and dancing. Ladies will attend. At the next meeting of the club on October 11, E. T. Horn, chief of yard and terminal operation of the Baltimore & Ohio, will present a paper on Main Tracking and Terminal Operation.

A. S. C. E. Nominating Committee's Report

W. F. Reeves, chairman of the nominating committee of the American Society of Civil Engineers, has announced the nominations for officers of the society as follows: For president, C. E. Grunsky; for vice-president, Zone 1, Lincoln Bush; for vice-president, Zone 4, G. G. Anderson; for directors, District 1, Thaddeus Merriman and P. G. Brown; for director, District 4, Robt. Farnham; for director, District 11, A. O. Ridgway; for director, District 14, Alex. Maitland, Jr.; for director, District 15, J. M. Howe.

Decisions of Labor Board

The third annual edition of the decisions of the United States Railroad Labor Board has been published and is being distributed. In this edition certain miscellaneous subjects heretofore included have been left out. A separate volume is to be issued containing the cumulative index digest which will contain reference to all the decisions issued by the board. In all other respects the subjects included in this volume are the same as in previous editions and the general arrangement is maintained. The volume contains 904 decisions handed down during 1922.

The Muscatine, B. & S.

Patrons of the Muscatine, Burlington & Southern, which has applied to the Interstate Commerce Commission for permission to abandon its line, are taking the same steps as those of the patrons of the Chicago, Peoria & St. Louis during recent months to prevent the loss of their transportation service. The Burlington (Ia.) Shippers' Association and a number of committees representing communities along the line have filed formal protest with the Interstate Commerce Commission against the proposed abandonment. Farmers and business men are trying to raise the necessary $200,000 which has been fixed as a minimum price for the property in case no other means of continuing operation is found. The road is 54 miles long, from Muscatine, Ia., south to Burlington.

Master Blacksmiths Elect Officers

After the presentation and discussion of technical papers, the International Railroad Master Blacksmiths' Association, in convention at the Hotel Sherman, Chicago, as reported in the *Railway Age,* of August 25, page 355, took up several matters of association business, and then elected the following officers for the ensuing year: President, George Hutton (N. Y. C.), Albany, N. Y.; first vice-president, J. J. Eagan (N. Y., N. H. & H.), New Haven, Conn.; second vice-president, H. W. Laughridge (P. & L. E.), McKee's Rocks, Pa. W. J. Mayer (M. C.),

Detroit, Mich., was re-elected to the office of secretary-treasurer and C H. Nutter (B. & M.), North Billerica, Mass., was appointed chairman of the executive committee. In view of its central location and facilities for taking care of conventions, Chicago was selected as the place for the 1924 convention.

B. & O. Veterans

The Baltimore & Ohio Veteran Employes' Association held its first annual outing at Cincinnati, O., on August 23 and commemorated the 40 years' service of C. W. Galloway, vice-president in charge of operation and Archibald Fries, vice-president in charge of traffic. Gold buttons were given to these men. A banquet was held at which addresses were made by the mayor, a former mayor and the president of the Chamber of Commerce. It is estimated that 25,000 people attended the outing. Twenty special trains were run from New York, Chicago, St. Louis, Baltimore and other cities including three from Baltimore, and a 12-car train from the Parkersburg-Marietta territory. There were five cars from Toledo, 20 from Newark division points, five from the Akron division, 15 from Chicago, 31 from Garrett, Ind., and stations east to Deshler, 15 from Willard and surrounding territory and 15 from Washington, Ind., Seymour, North Vernon and Louisville.

Telegraph Section Meeting

The Telegraph & Telephone Section of the American Railway Association will hold its annual meeting at Colorado Springs, Colorado, on Tuesday, Wednesday and Thursday, September 18, 19 and 20. The principal committee reports are as follows:

Tuesday—No. 1, Construction and maintenance, outside plant; pole lines, wires and cables; wire crossings.

Wednesday—No. 1 (continued); underground construction; transpositions. No. 2, Construction and maintenance, inside plant. Apparatus; materials and tools; locations and layouts; circuits and current supply; installation and maintenance. No. 3, Protection against electrolysis. No. 4, Electrical protection. No. 5, Telegraph and telephone development.

Thursday—No. 6, Message traffic. No. 7, Inductive interference. No. 10, Education and training of employees. No. 11, Telegraph and telephone transmission. No. 12, Radio and wire carrier systems.

The main feature, besides the discussion of committee reports, will be the reading of three papers, two on Wednesday and one on Thursday. W. P. Elstein, of the American Telephone & Telegraph Company will read a paper on accident prevention and allied work in the Bell system; William H. Capen, of the Western Electric Company, will read one on recent developments in telephone equipment for train dispatching, and H. S. Osborne, of the American Telephone and Telegraph Company, will discuss recent progress in long distance telephone transmission.

The election of officers comes at the end of the third day.

Plans have been made to run a special train for this convention over the Chicago & North Western, leaving Chicago at 12:15 a. m. on Sunday, September 16. Reservations are made by H. G. Van Winkle, 148 South Clark street, Chicago.

National Safety Council

The National Safety Council will hold its twelfth annual Congress at the Hotel Statler, Buffalo, N. Y., on October 1, 2, 3, 4 and 5. The opening session is on Monday morning at 10 o'clock when Marcus A. Dow, president of the council, will deliver his address. Another address on Monday will be that of H. A. Rowe, claims attorney of the D. L. & W., in the afternoon, on the careful crossing campaign. On Tuesday afternoon, there will be an exhibition of 100 new safety stereopticon slides, showing new developments in safeguarding. These will be presented by C. B. Auel. Another item of interest to railroad men will be a discussion, on Wednesday evening, of the bulletin board as an indispensable safety advertiser. Mr. Dow is scheduled to speak again on Tuesday afternoon, before the public safety session, on the work which he has been doing in the Bureau of Public Safety of the New York Police Department.

The foregoing are the principal items in the program which appear to be of special interest to readers of the *Railway Age*, until we come to the steam railroad section. This section, of which L. G. Bentley, of the Chesapeake & Ohio, is chairman, is to hold sessions in the forenoon of Tuesday, Wednesday and Thursday. A dozen interesting topics are scheduled for discussion at these sessions but the speakers have not yet been announced.

Satisfactory Settlements of Grievances on the P. R. R.

An analysis of the operation of the employee representation plan on the Pennsylvania Railroad System for the first half of this year shows that the vast majority of grievances are satisfactorily settled at conferences with local officers. A total of 3,066 controversial questions were taken up with officers below division superintendents. The number taken to the general manager, totaled 223 and the number referred to the reviewing committees 84. Experience indicates not only that the local officers and employees are able to settle their differences at home but also that final settlement of cases appealed is expedited more than has ever before been possible. Of the cases appealed to the joint reviewing committees about half were decided in favor of the management. In these committees all members have equal votes and a two-thirds vote is necessary to reach a decision. About one-fourth of the cases were withdrawn after being taken up with the officers and about one-fourth were appealed to the next higher authority. Since this plan was established by joint action of the management and employees about two and one-half years ago, only two cases have failed of final determination in the reviewing committees. In one case the matter was referred to arbitration and the award unanimously accepted by the joint reviewing committee. In the other case a joint investigation of facts and a recommendation by one management representative and one employee representative of the joint reviewing committee was used as a basis of final settlement by that body.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—F. M. Nellis, 165 Broadway, New York City. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—Joseph Sinkler, Pilot Packing Company, 122 South Michigan Ave., Chicago. Meeting with Air Brake Association.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—L. A. Stone, C. & E. I. Ry., Chicago.

AMERICAN ASSOCIATION OF ENGINEERS.—C. E. Drayer, 63 E. Adams St., Chicago.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—Annual Convention, October 23, St. Louis, Mo.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 So. Michigan Ave., Chicago. Next meeting, June 3, 1924, Montreal, Canada.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting September 17, 1923, Montreal, Que., Canada.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothchild, Room 400, Union Station, St. Louis, Mo. Next meeting, June 18-20, 1924, Buffalo, N. Y.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—J. W. Welsh, 8 W. 40th St., New York. Next convention, October 8-12, Atlantic City, N. J.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—C. Borcherdt, 202 North Hamlin Ave., Chicago, Ill.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, General Secretary, 30 Vesey St., New York, N. Y.

Division I.—Operating, J. C. Caviston, 30 Vesey St., New York, N. Y.

Freight Station Section (including former activities of American Association of Freight Agents).—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association).—J. C. Caviston, 30 Vesey St., New York, N. Y.

Safety Section.—J. C. Caviston, 30 Vesey St., New York.

Telegraph and Telephone Section (including former activities of the Association of Railway Telegraph Superintendents).—W. A. Fairbanks, 30 Vesey St., New York, N. Y. Next convention, September 18-20, Colorado Springs, Colo.

Division II.—Transportation (including former activities of the Association of Transportation and Car Accounting Officers).—G. W. Covert, 431 South Dearborn St., Chicago, Ill.

Division III.—Traffic, J. Gottschalk, 143 Liberty St., New York.

Division IV.—Engineering, E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Next annual meeting, March 11-13, 1924, Chicago. Exhibit by National Railway Appliances Association.

Construction and Maintenance Section.—E. H. Fritch.

Electric Section.—E. H. Fritch.

Signal Section (including former activities of the Railway Signal Association).—H. S. Balliet, 30 Vesey St., New York, N. Y. Next meeting November 14, Hotel Pennsylvania, New York. Annual meeting, March 13 and 14, 1924, Chicago.

Division V.—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill.

Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association).—V. R. Hawthorne,

431 South Dearborn St., Chicago, Ill. Annual convention, September 4-6, Hollenden Hotel, Cleveland, Ohio.

Division VI.—Purchases and Stores (including former activities of the Railway Storekeepers' Association).—W. J. Farrell, 30 Vesey St., New York, N. Y.

Division VII.—Freight Claims (including former activities of the Freight Claim Association).—Lewis Pilcher, 431 South Dearborn St., Chicago, Ill. Next convention, April, 1924, New Orleans, La.

Car Service Division.—C. A. Buch, 718 18th St., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Next convention, October 16-18, 1928, Hotel Gowman, Seattle, Wash. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—W. H. Hill, Agricultural Agent, New York Central, Chicago. Semi-annual meeting, December 6 and 7, Chicago; annual meeting, May 14-16, 1924, Savannah, Ga.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(Works in co-operation with the American Railway Association, Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Next annual meeting, March 11-13, 1924, Chicago. Exhibit by National Railway Appliance Association.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—(See American Railway Association, Division V.)

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—R. D. Fletcher, 1145 East Marquette Road, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—T. F. Whittelsey, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY FOR STEEL TREATING.—W. H. Eisenman, 4600 Prospect Ave., Cleveland, Ohio.

AMERICAN SOCIETY FOR TESTING MATERIALS.—C. L. Warwick, 1315 Spruce St., Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Prof. J. H. Dunlap, 33 W. 39th St., New York. Regular meeting 1st and 3d Wednesdays in month, except July and August, 33 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

Railroad Division.—A. F. Stuebing, Bradford Draft Gear Co., 23 W. 43rd St., New York.

AMERICAN TRAIN DISPATCHERS' ASSOCIATION.—C. L. Darling, 1310-1311 Mallers Bldg., Chicago, Ill.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—P. R. Hicks, Room 1146 Otis Bldg., Chicago. Next convention, January 15-17, 1924, Muehlebach Hotel, Kansas City, Mo.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, Northern Pacific Ry., St. Paul, Minn. Next annual meeting, May, 1924, West Baden, Ind.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Annual convention, November 6-9, Hotel La Salle, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, 320 Munsey Bldg., Washington, D. C.

ASSOCIATION OF RAILWAY SUPPLY MEN.—A. W. Clokey, 1658 McCormick Bldg., Chicago. Meeting with International Railway General Foremen's Association.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—(See American Railway Association, Division I.)

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railway Association, Division II.)

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—John Nelson, Joseph E. Nelson & Sons, 3240 South Michigan Ave., Chicago. Meeting with convention of American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—W. A. Booth, 53 Rushbrook St., Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2nd Monday in month, except June, July and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—Thomas B. Koeneke, 604 Federal Reserve Bank Bldg., St. Louis, Mo. Meetings, first Tuesday in month at the American Hotel Annex, St. Louis.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Meetings, 2d Thursday, January to November, Hotel Iroquois, Buffalo, N. Y. Interim meetings, 2d Thursday, February, April, June, Hotel Statler, Buffalo, N. Y. Ladies night, September meeting. Jubilee dinner, January 9, Hotel Statler.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. P. Elliott, Terminal Railroad Association of St. Louis, East St. Louis, Ill. Annual meeting, October 3, 4 and 5, Hotel Sherman, Chicago, Ill.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—D. B. Wright, 34th St. and Artesian Ave., Chicago, Ill. Meeting with Chief Interchange Car Inspectors' and Car Foremen's Association.

CINCINNATI RAILROAD CLUB.—W. C. Cooder, Union Central Bldg., Cincinnati, Ohio. Meetings, 2d Tuesday in February, May, September and November.

DIXIE RAILWAY CLUB.—T. C. Schley, 71 Conti Street, Mobile, Ala. Regular meetings, bi-monthly, second and fourth Fridays, Battle House Hotel, Mobile, Ala.

EASTERN RAILROAD ASSOCIATION.—E. N. Bessling, 614 F St., N. W., Washington, D. C.

FREIGHT CLAIM ASSOCIATION.—(See American Railway Association Division VII.)

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—C. H. Treichel, Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3rd Friday in month, Room 1414 Manhattan Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—George P. White, 747 Railway Exchange, Chicago. Meeting with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. B. Hutchison, 6000 Michigan Ave., Chicago. Next convention, May 26-29, 1924, Hotel Sherman, Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn. Annual convention, September 4-7, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—Bard Browne, Superheater Co., 17 E. 42nd St., New York. Meeting with International Railway Fuel Association.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York. Next convention, May 20-23, 1924, Hotel Sherman, Chicago.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Division V.)

MASTER CAR BUILDERS' ASSOCIATION.—(See A. R. A., Division V.)

NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—J. S. Penney, T. J. Moss Tie Company, St. Louis, Mo. Next convention, January 17-18, 1924, Muehlebach Hotel, Kansas City, Mo.

NATIONAL ASSOCIATION OF RAILWAY AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Next convention, Dec. 4, 1923, Miami, Fla.

NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, People's Gas Bldg., Chicago. Annual exhibition at convention of American Railway Engineering Association.

NATIONAL SAFETY COUNCIL.—W. H. Cameron, 168 North Michigan Ave., Chicago. Annual congress, October 1-5, Buffalo, N. Y.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, excepting June, July, August and September, Copley-Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3rd Friday in month, except June, July and August, at 29 W. 39th St., New York. Annual dinner, December 6, Hotel Commodore, New York.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 600 Liberty Bldg., Broad and Chestnut Sts., Philadelphia, Pa.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month, except June, July and August, Fort Hotel, Pittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION. J. Scribner, General Electric Co., Chicago. Annual meeting with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—J. W. Foggs, Boss Nut Company, 1732 N. Kolmar Ave., Chicago. Meeting with Traveling Engineers' Association, Sept. 11-14, Hotel Sherman, Chicago.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio. R. R., Baltimore, Md. Annual meeting, October 16-18, Cleveland, Ohio.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, C. & O. Ry., Richmond, Va.

RAILWAY SIGNAL ASSOCIATION.—(See A. R. A. Division IV, Signal Section.)

RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A. Division VI.)

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meeting with A. R. A. Division V.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A. Division I.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 25 and 26, William Penn Hotel, Pittsburgh, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W. Ry., Sterling, Ill. Next convention, September 18-20, 1923, Hotel Sherman, Chicago. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, P. O. Box 1205 Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. L. Carrier, Car Serv. Agt., Tenn. Cent. Ry., 319 Seventh Ave., North Nashville, Tenn.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—H. S. White, 9 N. Jefferson St., Chicago.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo-Ajax Corporation, Hillburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Annual meeting, September 11-14, 1923, Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—Bruce V. Crandall, 605 North Michigan Ave., Chicago. Regular meetings, 3d Monday each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, 1735 Monadnock Bldg., Chicago, Ill.

Building a Railway Tunnel in South Africa

Traffic News

The Wabash, after an interruption of years, has resumed the sale of through tickets to the City of Mexico.

C. S. Gibson has been appointed traffic commissioner of the newly organized Traffic Bureau of the Chamber of Commerce of Paris, Tex.

Of the 1,925 suburban passenger trains arriving at Jersey City, N. J., on the Erie Railroad, during the month of July, only eight arrived behind time.

Lines in the Western Passenger Association will sell tickets to Chicago for the National Live Stock Exposition, to be held in that city from December 1 to 8, at a fare and a half for the round trip.

A petition for the adjustment of rates to govern the transportation of calves, hogs, sheep and goats has been filed with the Texas Railroad Commission by the Live Stock Traffic Association of Ft. Worth, Tex. It is proposed as a basis for consideration that the rates on double deck cars shall not exceed rates now in effect on stock cattle and on single deck cars not to exceed a universal basis of 75 per cent of the rates applicable to the same animals in condition for slaughter.

The Dixie Railway Club has been organized at Mobile, Ala., for the purpose of advancing the science of railroading, and bringing into closer relationship railroaders, railway supply men and employees of water transportation lines. The associate membership also includes traffic managers of chambers of commerce and of industries. The club has about 200 members. G. P. Brock is president, J. H. Cassidy and R. G. Lauten are vice-presidents, R. C. Schley is secretary and G. M. White, assistant treasurer of the Gulf, Mobile & Northern, is treasurer.

To put Georgia peaches on the distant markets of the east and west in good condition, the Southern Railway operated 173 special peach trains during the past season. All were run from Atlanta, 106 going to Potomac Yards, Va., and 67 to Cincinnati, 5,700 cars altogether. Of this total, 5,312 cars were re-iced at Inman Yards (Atlanta). Including August 18, the total movement from Georgia had been 8,559 cars, according to reports of the United States Department of Agriculture. This is the second largest crop ever produced by Georgia orchards, having been exceeded only by the crop of 1921, which ran to 10,468 cars. During the entire season this year the supply of refrigerator cars and ice was ample.

Berries in Barrels

Berries are now shipped in large quantities from the Puget Sound territory in barrels, according to D. C. Pettibone, manager of express traffic of the Northern Pacific Railway. Barreled berries, he says, are the result of an experiment begun in 1917 and made so successful that in 1919 about 3,500 barrels were packed; in 1920 about 10,000, and in 1921 the same number. In 1922 the total number of barrels was over 21,000. This year the districts between Portland, Ore., and Bellingham, Wash., will put up about 35,000 barrels of berries.

The berries are hulled, or stemmed, and packed fresh, without cooking, in barrels holding 450 lb. net. The packer puts in about 20 lb. of berries at a time and 10 lb. of sugar; the barrel is placed on a rocker and each load of berries and sugar is rocked back and forth until the berries are coated with sugar. When filled, the barrels are sealed and placed in cold storage within 24 hours. They are kept at a temperature of from 20 to 28 degrees. The barrels are later shipped under refrigeration to eastern points.

Heretofore the production of berries was an unstable industry, but it is now considered one of the state resources of both Oregon and Washington. Seattle's municipal cold storage plants offer low rates which enable the western berry producer to compete with middle country growers in the barreled berry market. These berries are used by preserving companies, pie companies and ice cream makers.

Commission and Court News

Personnel of Commissions

J. H. Agate has resigned from the Bureau of Finance of the Interstate Commerce Commission to become assistant general counsel of the New York, Chicago & St. Louis. Mr. Agate has been in charge of the section of the bureau which handles applications for certificates of public convenience and necessity.

Court News

Warning Trackmen of Approaching Trains

The Missouri Court of Appeals (Springfield) holds that a section hand cannot recover on the theory that the foreman should have warned him of the approach of a train, when he knew a train was approaching, but thought it was on the other track.—Carter v. St. Louis & S. F. (Mo. App.) 249 S. W. 124.

Shipper of Stock Must Take Care to Minimize Damage, Though Carrier is Negligent

Shippers at 5 p. m. placed hogs in the stock pen before shipment. Noticing a hole in the fence, they guarded it for some time, then left for supper. The hogs were loaded at 6:45 p. m., except 28 which had escaped through the hole. The Texas Court of Civil Appeals holds there could be no recovery for the loss of these, since the shippers should have guarded the fence half an hour longer or nailed a plank across it. It was their duty to take due care to avoid all consequential damages from the railroad's negligence, and to take reasonable steps to make the damage as small as possible. The cost of the plank and the labor required to put it on would have been the measure of damages, if that had been done.—St. Louis Southwestern v. Brown & Co. (Tex. Civ. App.) 248 S. W. 97.

Labor Board Decisions

Ticket Agent and Operator-Ticket Clerk Positions Interchangeable

Under normal conditions the ticket office force at Middletown, N. Y., on the Erie consists of a supervisory agent and three positions of operator-ticket clerk. The first trick was from 7 a. m. to 3 p. m., the second trick from 3 p. m. to 11 p. m., and the third trick from 11 p. m. to 7 a. m. On March 15, 1921, the first-trick position was abolished and the hours of the second trick were changed to extend from 4 p. m. to 12 midnight; and the third trick from 12 midnight to 8 a. m. The supervisory ticket agent, in addition to his other work, handled the office duties which under normal conditions were assigned to the first-trick operator-ticket clerk. On July 13, 1921, the position of first-trick operator-ticket clerk was re-established in order to take care of the summer business. After the summer travel was over, the position was again abolished on October 15, 1921, and was re-established again on May 6, 1922, in order to handle the business during the summer.

The employees protested against this action of the carrier on the ground that the position had not been abolished, and that the supervisory ticket agent held no seniority rights in the telegraph department. They further claimed that the supervisory ticket agent is not entitled to do the work of the first-trick operator-ticket clerk.

The carrier contended that the position of first-trick operator-ticket clerk was not filled by an employee of another department and that the duties and work devolving upon that position had decreased to such an extent that economical operation justified it in requiring the supervisory ticket agent to assume the duties of the position in addition to his other duties.

The Labor Board denied the claim of the employees. (*Decision No.* 1867).

Foreign Railway News

50 Killed in Accident in Poland

Fifty persons were killed and 100 injured when a train en route from Vilna, Poland, to Warsaw, was derailed near Lida on August 23. The derailed train crashed into a dam, which broke, flooded the wrecked train and added to the casualties which had already been caused by the derailment.

Railway Posters by a Famous Cartoonist

The London & North Eastern has made a practice of engaging well-known artists to design posters advertising the attractions of various cities on its lines to tourists and excursionists as well as calling attention to other services which it offers. The accompanying illustration is reproduced, through the courtesy of the company, from a two-color poster, 25 in. wide and 40 in. high,

advertising the recently-established practice of reserving seats in trains for a small fee. This poster was prepared by G. E. Studdy, the well-known cartoonist. The dog secure in his reserved seat is "Bonzo," the creation of Mr. Studdy. "Bonzo" is probably almost as familiar to the English public as Mutt and Jeff are to Americans and doubtless this fact served to draw considerably more attention to the poster than could have been secured by an unillustrated announcement.

Railroad Accidents in Great Britain

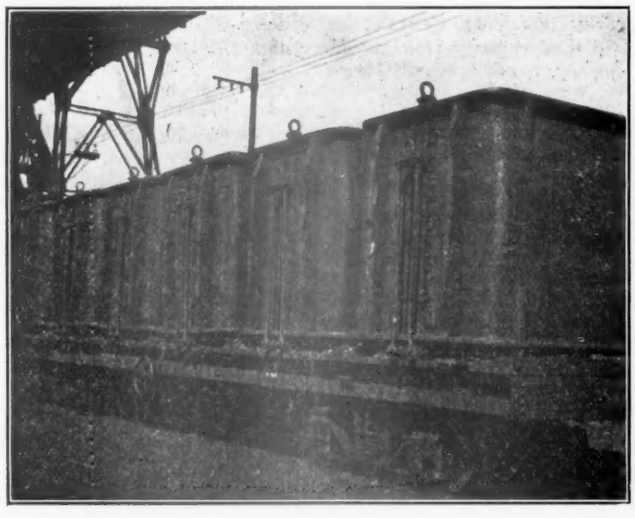
The Ministry of Transport (Great Britain) has issued a report, signed by Colonel J. W. Pringle, chief inspecting officer, on railway accidents occurring in the year 1922. Ireland is now left out, and the total length of railways is given as 20,298 miles, nearly all double track. In train accidents, in 1922, five passengers, four employees and 12 other persons were killed and 406 passengers, 83 employees and 30 other persons were injured; as compared with a record in 1921 of 18 passengers, 10 employees and 2 other persons killed and 589 passengers, 75 employees and 14 other persons injured. A table of average yearly casualties for 10 years, ending with 1920, with Ireland included, shows the number of passengers killed in train accidents as 37 and of injured 590; employees killed, 7.

Taking the totals of all classes, in 1922, we find 85 passengers, 240 employees and 403 other persons killed and 2,847 passengers, 15,968 employees and 647 other persons injured. These items aggregate 728 persons killed and 19,462 injured, in 1922, as compared with 765 killed and 18,973 injured in 1921. The report gives the usual analysis of causes of the most serious accidents. The number specially investigated by the inspecting officers in 1922 was 28; but only 6 of the 28 were attended with loss of life.

Electric Railway in Central Africa

The following statement by the Belgian Minister of Colonies of the conditions under which the Leopoldville-Matadi Railway (Central Africa) will be electrified has been received by the Department of Commerce from Consul General H. M. Morgan, Brussels:

"It will be the first important railroad in Central Africa to be electrified. We possess along the river, throughout the whole region, waterfalls and rapids capable of producing considerable power. Researches made by the railroad company have enabled them to establish that more than 100,000 horsepower may be readily obtained for the use of the railroad, and that in addition there exists unlimited reserves for extension. For the electrification of the railroad 30,000 horsepower will suffice, at least in the beginning, and we will thus replace the coal which has to come from Europe and which is very expensive, by natural resources existing on the spot and which up to now have not been utilized. It is estimated that the money required for electrification will be 150 million francs ($6,750,000 at the present rate of exchange). The gage of the line is at present 75 cm. (29½ in.). It is impossible for technical reasons to electrify the line efficiently unless the gage is made at least 1.06 meters (41¾ in.). Consequently the widening of the lines will have to be undertaken before any other work is begun."



Container Car for Coaling Ships at Durban, South Africa

Equipment and Supplies

Locomotives

THE LAKE CHAMPLAIN & MORIAH is inquiring for one locomotive.

THE A. S. JOHNSON LUMBER CO., Reader, Ark., will soon be in the market for three oil burning locomotives.

THE PACIFIC LUMBER COMPANY has ordered one Mikado type locomotive from the Baldwin Locomotive Works.

SUL MINIERA REDE DE VIACAO, Brazil, has ordered two 2-8-0 and six 4-6-0 type locomotives from the Baldwin Locomotive Works.

CAMINHOS DE FERRO DE LOURENCO MARQUES, Portuguese East Africa, has ordered two Pacific type locomotives from the Baldwin Locomotive Works.

THE CHESAPEAKE & OHIO will receive bids until 12 o'clock noon, September 4, at Richmond, Va., for work on 10 of its Mallet locomotives, classes H-2, H-4 and H-6.

THE NORWOOD & ST. LAWRENCE will place an order shortly for a Mogul type locomotive of about 70 tons. The company is also contemplating the purchase of a snow plow.

Freight Cars

C. R GREER, New York, is inquiring for 25 flat cars.

THE NEW YORK CENTRAL is inquiring for 100 automatic dump cars.

THE NORWOOD & ST. LAWRENCE has placed an order for 35 freight cars.

THE BALTIMORE & OHIO is asking for prices on the repair of 200 coke cars.

THE JONESBORO, LAKE CITY & EASTERN is rebuilding 100 box cars in its own shops.

MITSUI & COMPANY, New York City, are inquiring for 60 box cars of 30 gross tons' capacity.

THE CHESAPEAKE & OHIO is asking for prices for making repairs to 500 steel coal cars of 55 tons' capacity.

SWIFT & COMPANY, Chicago, has ordered 100 steel underframes for refrigerator cars from the Bettendorf Company.

THE NEW YORK CENTRAL has ordered 500 hopper car bodies of 55 tons' capacity from the Merchants Dispatch Transportation Company.

THE BRADFORD OIL REFINING COMPANY, Bradford, Pa., has ordered 5 tank cars of 8,000 gal. capacity from the General American Tank Car Corporation.

THE MINNESOTA STEEL COMPANY, reported in the *Railway Age* of May 5 as inquiring for 20 flat cars, has ordered this equipment from the Standard Steel Car Company.

THE MONTOUR RAILROAD, reported in the *Railway Age* of August 4 as inquiring for from 300 to 500 hopper cars of 55 tons' capacity, has ordered 500 cars from the Standard Steel Car Company.

THE UNION PACIFIC, reported in the *Railway Age* of August 11 as contemplating buying 250 tank cars, has ordered 200 tank cars of 12,500 gal. capacity from the Standard Tank Car Company.

THE NORFOLK & WESTERN, reported in the *Railway Age* of August 18 as asking for prices on the repair of 1,000 hopper cars of 57½ tons' capacity, has arranged for the repair for 500 of these cars with the Ralston Steel Car Company and 500 with the Virginia Bridge & Iron Company.

THE CENTRAL OF NEW JERSEY, reported in the *Railway Age* of July 28 as inquiring for repairs to 300 box cars, has arranged for the repair of 600 cars as follows: For 200 with the American Car & Foundry Company, 200 with the Pressed Steel Car Company and 200 with the Standard Steel Car Company at its Middletown works.

Passenger Cars

BURR & COMPANY is inquiring for 1 dynamometer car.

THE UNION OF SOUTH AFRICA is inquiring for 25 first class and 25 second class narrow gage coaches.

THE HAVANA CENTRAL has ordered 3 Mack gasoline rail motor cars from the International Motor Company for use on the United Railways of Havana.

Iron and Steel

THE GREAT NORTHERN has ordered 920 tons of structural steel for a viaduct at Des Lacs, N. D., from the Milwaukee Bridge Co.

THE MISSOURI PACIFIC has ordered 150 tons of structural steel for bridge repairs at Gleason, Ark., from the American Bridge Company.

THE CHICAGO GREAT WESTERN has ordered four 70-ft. deck plate girder spans totaling 138 tons from the American Bridge Company.

THE JAPANESE GOVERNMENT RAILWAYS placed orders with the Bethlehem Steel Corporation for 11,000 tons of 60-lb. and 75-lb. rail and splice bars.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 2,536 tons of structural steel consisting of plate girder spans from the American Bridge Company.

THE LOUISVILLE & NASHVILLE has ordered 450 tons of structural steel from the American Bridge Co. and 400 tons from the Mt. Vernon Bridge Co.

THE NEW YORK, CHICAGO & ST. LOUIS has ordered 150 tons of structural steel for a machine shop at Stony Island (Chicago), Ill., from the Fort Pitt Bridge Works.

Signaling

THE SOUTHERN PACIFIC has ordered from the General Railway Signal Company one 8-lever electric interlocking machine for installation at Houston, Texas.

THE CHICAGO, BURLINGTON & QUINCY has ordered from the Federal Signal Company two electric interlocking machines for installation at Oxford, Neb., and Quincy, Ill.; 8 levers each.

THE TEXAS & PACIFIC has ordered from the Federal Signal Company two eight-lever Saxby & Farmer mechanical interlocking machines, with bridge circuit controllers, and other materials for the protection of two drawbridges in Louisiana.

THE NEW YORK CENTRAL has ordered from the Federal Signal Company 24 three-position, upper quadrant, top post semaphore signals for installation on its lines west of Buffalo and a 32-lever style "A" mechanical interlocking machine with 26 working levers, for installation at Jersey Shore, Pa.

THE CHICAGO & WESTERN INDIANA has placed an order with the General Railway Signal Company for the complete installation of an electric interlocking plant at 74th street, Chicago, and automatic block signals for the line between 64th and 81st streets, Chicago. The interlocking machine will be of the model 2 unit lever type, having 79 working levers, 10 spare levers and 31 spare spaces. Model 5 switch machines will be used and all high, dwarf, semi-automatic and automatic signals are to be model 2A.

Supply Trade News

The Truscon Steel Company is preparing plans for a new plant at Pittsburg, Cal.

R. W. Benson, eastern representative at New York City of the **Flannery Bolt Company,** Pittsburgh, Pa., has resigned, and the company has closed its eastern office at 41 East Forty-second street, New York City.

The American Car & Foundry Company has purchased a tract of land 260 ft. by 1,931 ft. extending from the south branch of the Chicago river almost to Blue Island avenue and fronting on Wood street, Chicago, from the Edward Hines Lumber Company.

The Canadian Engineering & Contracting Company, Ltd., has been organized in Winnipeg, Man., to engage in general engineering and construction work, and to act as consulting, supervising and constructing engineers and in an advisory capacity to railways. **John G. Sullivan,** consulting engineer, Winnipeg, and formerly chief engineer of the Canadian Pacific, Western lines, is president, **Theodore Kipp,** president of the Kipp-Kelly, Ltd., is vice-president, and **C. A. Monkman** of the Manitoba Steel & Iron Company, Ltd., is secretary of the new company.

Henry J. Bailey, vice-president of the **Consolidated Machine Tool Corporation of America,** Rochester, N. Y., has been elected president to succeed W. H. Marshall, deceased. Mr. Bailey began work with the Hilles & Jones Company, Wilmington, Del., in 1890 as a messenger boy, when he was 14 years old. He later served as shipping clerk and stenographer, and in 1900 was appointed secretary of the company, subsequently assuming charge of sales; and upon the death of Alfred R. Jones in October, 1918, Mr. Bailey was elected president of the same company. During his service he worked in all the different departments of the business. On the formation of the Consolidated Machine Tool Corporation of America in June, 1922, of which the Hilles & Jones Company forms a part, Mr. Bailey became vice-president of the new corporation in charge of the Hilles & Jones works at Wilmington, and now becomes president of the corporation with headquarters at Rochester, as above noted. The general offices of the corporation have been removed from New York City to Rochester, but its district selling organization will be continued at 17 East Forty-second street, New York City.

H. J. Bailey

Obituary

Waldo H. Marshall

While boys of his age were preparing for college Waldo H. Marshall was chief draftsman of the Rhode Island Locomotive Works. His ideas of engineering design particularly concerning locomotives and his ideals of managing men began to take form during his machinist apprenticeship at those works. Industrious study, deep thought, ability, a remarkable mind, clear and balanced, a lovable character, all combined in 35 years of constructive life, give the world a valuable and unusual legacy. Nearly all his work was either for or directly with railroads. With grade schools and night school as a foundation he became an engineer and an administrator. Because he was not a college man he was the more careful and thorough. Many a college educated engineer had to go back over his work and correct it because of the direct thinking, common sense methods of analysis of his superior.

In his early work he profited by association with David L. Barnes. He succeeded Mr. Barnes at the Rhode Island Locomotive Works. Then he went to New York on engineering work for the New York elevated and cable railroads. Before the Worlds Fair he took the editorship of the Railway Review in Chicago and later became editor of the Railway Master Mechanic, also in Chicago. During this time he designed the details of the movable sidewalk at the Worlds Fair. He also designed and patented the Simplex truck bolster, which represented the beginning of his influence upon the design of railroad rolling stock in the direction of maximum strength per unit of weight. That unnecessary weight should exist in either cars or locomotives troubled him. He must be credited with beginning systematic improvements in this direction.

W. H. Marshall

He continued editorial work with M. N. Forney on the American Engineer in New York, but with a strong desire for a railroad opportunity which came to him in 1897 in the position of assistant superintendent of motive power, Chicago & North Western. The Lake Shore & Michigan Southern made him superintendent of motive power in 1899 and here he began to give us the locomotive policy that not only this but every railroad needs. Track and bridges on that road were proverbially light. He began an epoch making series of locomotive designs, the best and most powerful the rails would take. He helped to get heavier track and bridges and followed with power developed in parallel with the means for carrying it. He was one of the pioneers in locomotive terminals and then in shop development. Results brought him into the operating department in 1902, first as general superintendent and then as general manager. During this time he found and advanced many a young man whom he trusted and who abundantly justified his judgment. In these men his ideas and ideals are going forward for the improvement of transportation. Many a young man must say that Waldo Marshall made him. The one who writes these words says it of himself. Waldo Marshall himself was trusted. He once told an intimate friend that in his railroad career he was only once turned down when he made a recommendation. That was when the road, without his knowledge, had already bought a small road that he thought should be acquired. The young railroad officer who "gets" this lesson from his life is fortunate.

At the time when railroads were beginning to realize the necessity for more powerful locomotives he was called in 1906 to the American Locomotive Company as its president. He not only helped materially to meet this need, but contributed a vital part in the direction of the change in locomotives from mere pullers of trains to efficient power plants.

In the World War he rendered service with J. P. Morgan & Company and with the Naval Consulting Board. At the close of the war he became chairman of the board of Gillespie & Company. At the time of his death he was chairman of the board and president of the Consolidated Machine Tool Corporation of America and director of several companies and financial institutions.

Through his life he sought to serve others. He served them well.

He was born June 7, 1864, in Providence, Rhode Island. He died at Barnstable, Massachusetts, August 23, surviving Mrs. Marshall less than three months.

G. M. BASFORD.

Railway Construction

CHESAPEAKE & OHIO.—This company has awarded a contract for the construction of a tie treating plant at Green Springs, Va., to William Dwyer, Cincinnati, Ohio.

CHICAGO & EASTERN ILLINOIS.—This company contemplates the construction of a new freight yard at Terre Haute, Ind., in connection with the new locomotive and car shops which were reported in the *Railway Age* of June 16.

CHICAGO, BURLINGTON & QUINCY.—This company has awarded a contract to the T. S. Leake Construction Company, Chicago, for the construction of a passenger station at Lamont, Iowa, as was reported in the *Railway Age* of August 11.

CHICAGO GREAT WESTERN.—This company is receiving bids for converting a water station to a water treating plant at Oelwein, Ia.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has awarded a contract to Jos. E. Nelson & Sons, Chicago, for the construction of water treating plants at Bensonville, Ill., and Mannheim, reported in the *Railway Age* of June 23.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has awarded a contract for the construction of a six-story addition to its building at 2435 Southport avenue, Chicago, to R. C. Wieboldt & Company. The building will be of concrete construction, 167 ft. by 68 ft.

CLEVELAND UNION STATION.—This company has awarded a contract to the Walsh Construction Company, Davenport, Iowa, for the excavation of the new site for the Union station at Cleveland, Ohio. The cost of the excavation work will be approximately $250,000.

DENVER & RIO GRANDE WESTERN.—This company was granted permission by the United States District Court on August 24 to lay narrow gage track from Durango, Colo., to Farmington, N. M., 49 miles, with the stipulation that the present standard gage track between the two terminals shall also be maintained.

GRAND TRUNK.—This company is receiving bids on a two-story, 90 ft. by 30 ft. brick extension to the freight house at Flint, Michigan.

ILLINOIS CENTRAL.—This company, reported in the *Railway Age* of April 14 as authorizing the construction of a two-story brick passenger station at Champaign, Ill., 45 ft. by 228 ft., has awarded this contract to Ellington Miller, Chicago.

ILLINOIS CENTRAL.—This company, in conjunction with the Pennsylvania, will construct a two-story brick passenger station with one-story express and baggage stations at Effingham, Ill., at an approximate cost of $100,000.

KANSAS CITY, CLAY COUNTY & ST. JOSEPH (Electric).—This company, in conjunction with the Missouri Highway Commission, will construct an overhead crossing 2½ miles from Liberty, Mo., to cost approximately $15,000.

LOUISIANA & ARKANSAS.—This company has awarded a contract to O'Neill & Sons, Hope, La., for the construction of an office building at Minden, La.

MISSOURI PACIFIC.—This company closed bids August 27 for the remodeling of a 25-stall roundhouse at Kansas City, Mo.

MISSOURI PACIFIC.—This company has awarded a contract to Ball & Peters, Little Rock, Ark., for the reballasting of its tracks between Gurdon, Ark., and El Dorado.

MOFFAT TUNNEL.—The Moffat Tunnel Commission, reported in the *Railway Age* of August 11 as receiving bids until August 25 for the boring of a main tunnel, 60 ft. by 24 ft. and a pioneer tunnel 8 ft. by 8 ft., six miles long, under the James Peak in Brand County, Colo., has postponed the date set for receiving bids until September 12.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—This company, which was reported in the *Railway Age* of August 4 as closing bids on August 6 for the construction of an eight-story office building at Nashville, Tenn., has awarded a contract for this building to the Southern Ferro Concrete Company, Atlanta, Ga. The building will be 50 ft. by 90 ft. and of reinforced concrete, faced with brick and terra cotta.

NEW YORK, CHICAGO & ST. LOUIS.—This company closed bids August 27 for the construction of a new roundhouse at West Frankfort, Ind.

OCHOCO TIMBER COMPANY.—This company contemplates the construction of a line from Prineville, Ore., to a recently purchased tract of 73,000 acres of pine timber 15 miles east of Prineville.

PHILADELPHIA & READING.—This company has awarded a contract to the McLean Contracting Company, of Philadelphia, for the furnishing of all labor, tools and appurtenances in connection with the driving of piles and construction of re-inforced concrete foundations for the coal thawing house to be located at Pier 18, Port Richmond, Philadelphia. This coal thawing house will be used in connection with the new car dumper plant under construction at that point. This contract calls for an expenditure of approximately $52,000. This covers labor only, the material being furnished by the railway.

RIO GRANDE CITY & NORTHERN.—This company has been chartered in Texas to build a line 85 miles long from Sam Fordyce, in Hidalgo county, to Rio Grande City in Starr county, and thence to a connection with the Texas Mexican railway in Webb county. The proposed line will follow a northwesterly direction to make the connection with the Texas Mexican line.

RIO GRANDE CITY & NORTHERN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from Samfordyce to Rio Grande City, Tex., 22 miles, at once, and a later extension to Mirando, making a total of 85 miles. V. H. Williams, Dallas, Tex., is vice-president of the company.

SOUTHERN PACIFIC.—This company has completed plans for the construction of a one-story machine shop, 85 ft. by 498 ft., in Los Angeles, Cal., to cost approximately $390,000 with equipment. This company's plans for the development of its shop facilities at Los Angeles at a total cost of approximately $1,000,000 were reported in the *Railway Age* of February 24.

STALEY SYSTEM (Electric).—Examiners for the Interstate Commerce Commission have recommended that this company's plan to build 1,240 miles of electric railway in Arizona, New Mexico, Colorado and California be not approved.

TERRE HAUTE, INDIANAPOLIS & EASTERN (Electric).—This company, jointly with the Interstate Public Service Company, the Union Traction Company and the Indianapolis & Cincinnati Traction Company, plans the construction of a large freight terminal at Indianapolis, Ind. The construction of the building will be undertaken at once in order that it may be completed within the next four or five months.

UNION PACIFIC.—This company has awarded a contract to Peterson, Shirley & Gunther, Omaha, Nebr., for the grading for 43 miles of second track between Granger, Wyo., and Leroy. This company has also awarded a contract to the Morrison-Knudson Company, Boise, Idaho, for the construction of ten miles of second track between Emory, Utah, and Echo. These projects were reported in the *Railway Age* of May 5. Track laying and the construction of bridges will be done by company forces. This company will construct a steel and concrete viaduct 118 ft. long over its tracks near Ozone, Wyo., for the accommodation of the vehicular traffic on the Lincoln Highway. Another concrete and steel viaduct with embankment approaches, the total length of which will be 1,575 ft., will be constructed over the track at Riverdale, Utah. This company has awarded to the Allied Contractors, Inc., Omaha, Nebr., for the elimination, by means of an open cut, of the twin tunnels, each 169 ft. in length, near Edson, Wyo.

UNION PACIFIC.—This company will construct a new passenger station, 34 ft. by 190 ft., at Laramie, Wyo., to cost approximately $175,000. Bids for the work will be called for in the near future.

Railway Financial News

BOSTON & MAINE.—*Six Months' Guaranty Certified.*—The Interstate Commerce Commission has issued a certificate certifying to the Secretary of the Treasury the amount of this company's guaranty for the six months' period following the termination of federal control as $11,220,615, of which a balance of $620,615 was to be paid.

GREENBRIER & EASTERN.—*Authorized to Issue Stock.*—This company has been authorized by the Interstate Commerce Commission to issue at par for cash $1,000,000 of capital stock.

KANSAS CITY NORTHWESTERN.—*Rehabilitation.*—Persons interested in the rehabilitation of the Kansas City Northwestern which ceased operation in 1920, are investigating the feasibility of voting bonds in the counties through which the road passes for the purpose of again putting the railroad into operation.

KANSAS CITY SOUTHERN.—*Equipment Trusts Offered.*—A new issue of $1,620,000 equipment trust 5½ per cent gold certificates, series E, is offered by Ladenburg, Thalmann & Co., and the National City Company at prices to yield from 5.30 per cent. to 5.65 per cent. The certificates will mature serially $108,000 per annum, September 1, 1924, to September 1, 1938, both inclusive.

LOUISVILLE & NASHVILLE.—*Asks Authority to Issue Bonds and Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to issue $15,862,000 of 5 per cent refunding mortgage bonds, series B, to be exchanged for a similar amount of series A, 5½ per cent bonds now held in the treasury and to sell $14,000,000 of the series B bonds to J. P. Morgan & Co., at 93 and an interest adjustment for the purpose of providing cash for improvements to roadway and equipment. The company also asks authority to assume obligation and liability in respect of an issue of $6,000,000 of 5 per cent equipment trust certificates.

MINNEAPOLIS & ST. LOUIS.—*Directors Resign.*—Protective Committee's Notice.—Jules S. Bache has resigned as chairman of the board and as a director of this company. LeRoy W. Baldwin and F. Q. Brown have also resigned as directors.

As a result of the recent receivership of the Minneapolis & St. Louis, the protective committee for the first and refunding mortgage 4 per cent 50-year gold bonds of the company and the first and refunding mortgage 4 per cent 50-year gold bonds of the Iowa Central, has engaged the engineering firm of Coverdale & Colpitts to make a detailed examination of maintenance and operation of the properties. A notice to bondholders says that the engineers will be asked to inquire into the condition and character of property covered by mortgages securing the bonds and report their views as to the probable future prospects of the railroads. Holders of the bonds are asked to deposit them, with the September 1 coupons attached, with the Empire Trust Company on or before September 20.

NEW ORLEANS GREAT NORTHERN.—*Annual Report.*—The annual report for the year ended December 31, 1922, issued this week, shows a net income of $186,570 as compared with a deficit of $405,767 in 1921. A comparative condensed summary of the income account is given below:

	1922	1921	Increase or Decrease
Total operating revenues	$2,547,750	$2,528,529	$19,221
Total operating expenses	1,701,012	2,246,554	—545,543
Net operating revenues	846,739	281,975	564,764
Less uncollectible railway revenues and taxes	183,750	188,796	—5,046
Operating income	662,989	93,179	569,810
Additions to income	79,615	111,705	—32,090
Gross corporate income	742,603	204,883	537,720
Deductions from income	556,033	610,650	—54,617
Income for year	186,570	405,767*	592,337

* Deficit.

OAHU RAILWAY & LAND COMPANY.—*Asks Authority to Issue Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue $2,500,000 of additional capital stock to be distributed pro rata to the stockholders to represent appropriated surplus.

OSWEGO & SYRACUSE.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $2,000,000 of first and refunding mortgage 5 per cent bonds to be guaranteed by the Delaware, Lackawanna & Western. Of the total, $1,193,000 is to be used to refund existing obligations and the balance is to provide for future capital expenditures.

READING COMPANY.—*Litigation Terminated.*—See article on another page of this issue.

SEABOARD AIR LINE.—*Asks Authority to Draw Down Bonds.*—This company has applied to the Interstate Commerce Commission for authority for the authentication and delivery of $809,000 of first and consolidated mortgage 6 per cent gold bonds to be pledged with the Secretary of the Treasury as security for a government loan.

SUPERIOR & SOUTHEASTERN.—*Application Denied.*—The Interstate Commerce Commission has denied this company's application for authority to operate in interstate commerce a line of 3.42 miles north from Loretta, Wis.

WACO, BEAUMONT, TRINITY & SABINE.—*Authorized to Issue Securities.*—The Interstate Commerce Commission has authorized this company to issue $1,149,000 of first mortgage, 6 per cent, 30-year bonds and $2,170,300 of common stock, for the purpose of acquiring the line from Trinity to Colmesneil, Tex., formerly owned by the Missouri, Kansas & Texas.; also $60,000 of equipment trust notes and 30 unsecured notes for $2,500 each.

Dividends Declared

Bangor & Aroostook.—Preferred, 1¾ per cent, quarterly, payable October 1 to holders of record September 15.

New York, Chicago & St. Louis.—Common and preferred, 1½ per cent, quarterly; both payable October 1 to holders of record September 15.

Trend of Railway Stock and Bond Prices

	August 28	Last Week	Last Year
Average price of 20 representative railway stocks	60.23	59.73	73.09
Average price of 20 representative railway bonds	82.70	82.60	89.51

SIGNAL LIGHTNING ARRESTER.—The Federal Signal Company, Albany, N. Y., has issued bulletin No. 14 describing its Neon gas filled tube lightning arrester, and bulletin No. 15 describing its all-electric interlocking.

Vauxhall Inspection Car Used by Assistant General Manager, South African Railways

Railway Officers

Financial, Legal and Accounting

R. E. DeNeefe has been appointed controller of the Birmingham & Northwestern, succeeding **F. M. Hicks,** who has resigned to devote all of his time to his duties as traffic manager.

J. H. Agate, in charge of the Public Convenience and Necessity Section of the Bureau of Finance of the Interstate Commerce Commission has been appointed assistant general counsel of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio.

Gordon Chambers has been appointed real estate agent and **Charles E. Dilkes, Jr.,** assistant real estate agent of the Philadelphia & Reading with headquarters at Philadelphia. Mr. Chambers succeeds **C. K. Klink** who has retired after a service of over 54 years with the Reading.

Operating

James Fitzmorris, superintendent of motive power of the Chicago Junction, with headquarters at Chicago, has been appointed to the newly created office of assistant to the general manager, with the same headquarters and the office of superintendent of motive power has been abolished.

Traffic

J. J. McManus has been appointed general agent, freight department, of the Nickel Plate with headquarters at New Orleans, La., succeeding A. A. Reinhardt, resigned.

E. F. Rice, chief of the tariff bureau of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., has been promoted to assistant general freight agent with the same headquarters.

J. L. Ferguson, general passenger agent of the Chicago & North Western, with headquarters at Chicago, has been promoted to assistant to the traffic manager, with the same headquarters. **M. R. Leahy,** assistant general passenger agent, with headquarters at Chicago, has been promoted to general passenger agent, with the same headquarters, succeeding Mr. Ferguson. Mr. Ferguson was born on August 23, 1853, in Henry county, Ky. He entered railway service in 1868 as a telegraph operator on the St. Louis, Kansas City & Northern, now a part of the Wabash. In 1875, he was appointed ticket clerk for the Chicago & North Western at Milwaukee, Wis., and was subsequently promoted to city passenger agent at the same place. Later, Mr. Ferguson was transferred to Chicago and after a time was promoted to assistant general passenger agent and ticket agent. He was promoted to general passenger agent, with headquarters at Chicago, in November, 1917, and was serving in this capacity at the time of his recent promotion to assistant to the passenger traffic manager, with the same headquarters.

J. L. Ferguson

F. L. Salisbury, traveling freight agent of the Louisville & Nashville, with headquarters at Houston, Tex., has been promoted to general agent, with headquarters at Jacksonville, Fla., succeeding A. G. Payne, promoted.

R. F. Waughop, freight representative of the New York, Chicago & St. Louis, with headquarters at St. Louis, Mo., has been appointed district freight agent with the same headquarters, succeeding P. L. Holtz, resigned.

S. F. Baker, general agent, freight department of the St. Louis Southwestern, with headquarters at Tyler, Tex., and **J. G. Winfield,** have been appointed assistant general freight agents, with headquarters at Tyler, Tex., and position of general agent, freight department has been abolished.

A. G. Payne, general agent for the Louisville & Nashville, with headquarters at Jacksonville, Fla., has been promoted to division freight agent with headquarters at New Orleans, La., succeeding G. S. Burnam, who has resigned. **F. L. Salisbury,** traveling freight agent, with headquarters at Houston, Tex., has been promoted to general agent with headquarters at Jacksonville, Fla., succeeding Mr. Payne.

Mechanical

O. T. Rees, assistant chief chemist of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., has been promoted to chief chemist, succeeding W. A. Powers, resigned.

P. Campbell, assistant superintendent of motive power of the Chicago Junction, with headquarters at Chicago, has been appointed to the newly created position of master mechanic, with the same headquarters and the office of assistant superintendent of motive power has been abolished.

Engineering, Maintenance of Way and Signaling

A. C. Shields, division engineer of the Chicago, Rock Island & Pacific, with headquarters at Trenton, Mo., has been appointed engineer of maintenance of way of the Denver & Rio Grande Western, with headquarters at Denver, Colo., effective September 1.

Purchasing and Stores

G. A. J. Carr, division storekeeper of the Chicago, Milwaukee & St. Paul, with headquarters at Minneapolis, Minn., has been promoted to assistant district storekeeper, with the same headquarters, and will be succeeded by **H. E. Rice,** division storekeeper, with headquarters at Austin, Minn., who in turn will be succeeded by **W. M. Glenny.**

Obituary

F. T. Mooney, formerly terminal superintendent of the Illinois Central, with headquarters at New Orleans, La., and more recently general superintendent of the Vacarro Brothers Railway Steamship Company, died at New Orleans on August 24.

Albert B. Corinth, general inspector of the Atlantic Coast Line with headquarters at Rocky Mount, North Carolina, died at his home on August 21. Mr. Corinth was born on January 2, 1854, at Philadelphia, Pa. He was educated at Girard College at Philadelphia, Pa., graduating with the class of 1870. He entered railway service on July 22, 1872, as apprentice on the P. & E. division of the Pennsylvania at Renovo, Pa. Since July 22, 1876, he had been consecutively six years in charge of cabinet shops of the Louisville & Nashville at Louisville, Ky.; one year in charge of freight car building with the Ohio Falls Car Company, Jeffersonville, Ind.; five years master car builder, Georgia division, East Tennessee, Virginia, and Georgia, at Atlanta, Ga.; three years in charge of freight equipment, Chicago & North Western at Chicago; three years in charge of the car department, Georgia Pacific division, Richmond & Danville at Birmingham, Ala.; six years foreman, car repairs, Southern Railway, Knoxville, Tenn. From January 30, 1900, to February 1, 1908, he was assistant superintendent Motive Power, Atlantic Coast Line, in charge of car department at Wilmington, N. C.; from February 1, 1908, to the day of his death he was general inspector of the same road at Rocky Mount, N. C.